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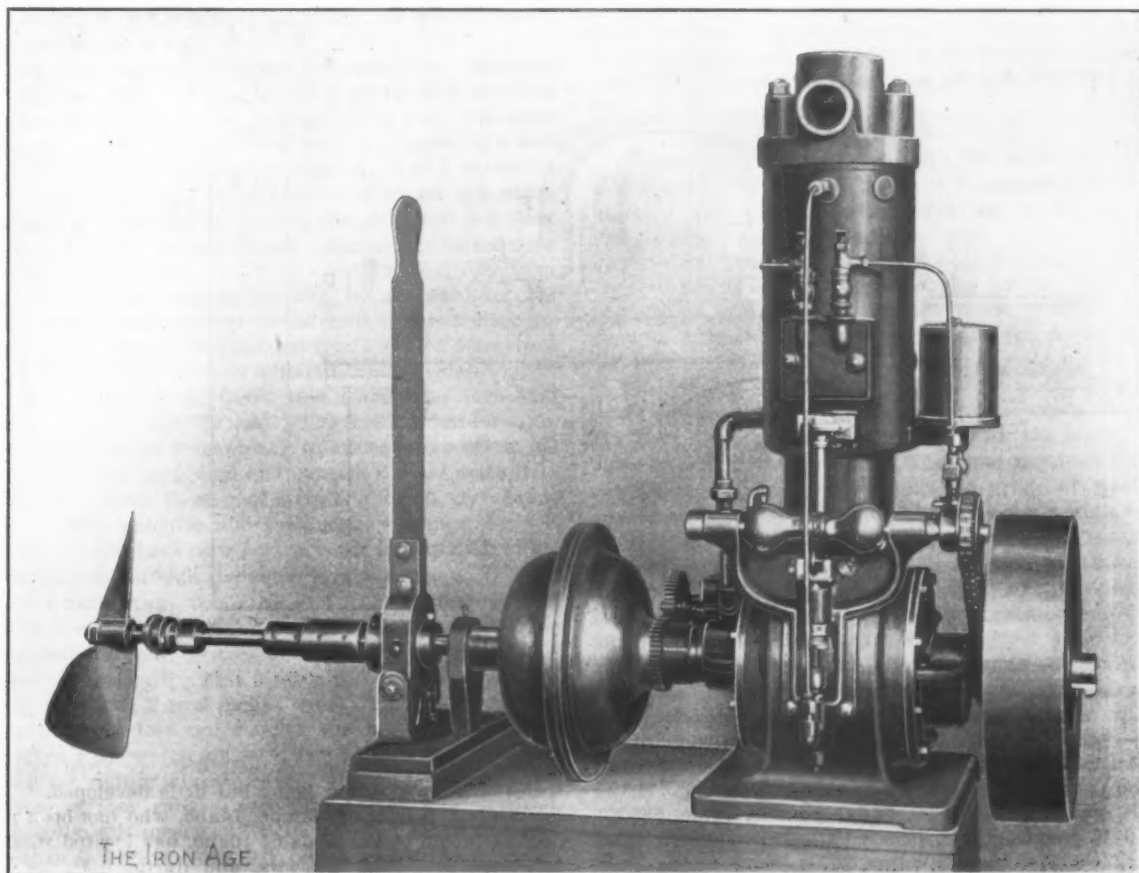
THE IRON AGE

THURSDAY, SEPTEMBER 3, 1903.

The Mietz & Weiss Marine Oil Engine.

The favorable reception of the stationary Mietz & Weiss kerosene engine and the numerous inquiries for a marine engine of the same type have led the makers to design the vertical engine shown in the accompanying half-tone. The general construction follows that of their horizontal pattern, which is of the two-cycle type, having an impulse at every turn of the crank shaft. The oil pump is operated by a centrifugal governor, specially designed to avoid any irregular action due to the rocking or rolling of the boat. It consists of a centrally fulcrumed weight rotating once, twice or thrice for every

which is keyed to the engine shaft A. There are two beveled frictional faces, K, at an angle of 17 degrees to the shaft. The friction wheel is keyed to the propeller shaft B, and can be brought into contact with the frictional surface of the drum direct for going forward, or into engagement with the bevel surface of the reversing gear by the lateral movement of the propeller shaft by means of the lever C. The reverse motion is transmitted by the frictions I and F, through the bevel gears G H J. These gears are carried by a bronze sleeve with three arms. The sleeve projects beyond the drum, where it is keyed to a stop arm, which prevents its rotating, but allows a slight lateral movement for the purpose explained



THE MIETZ & WEISS MARINE OIL ENGINE.

turn of the crank shaft for single, double and triple cylinder engines respectively. It imparts motion to a single pump plunger for every turn of its shaft, and measures an exact and perfectly even supply of oil for each cylinder, but variable for varying loads. The oil is vaporized in the cylinder, and mixed with the air current coming from the crank case while the piston is at its lower dead center, and compressed at the next counterstroke to about one-quarter of its volume. The ignition takes place at the moment the piston arrives at the inner dead center, and by a correctly designed igniter head never fails at any speed. This together with the positive oil supply by the force pump accounts for the precise and regular rise of explosion pressure shown in the indicator cards of these engines at various loads and speeds.

The reversing friction clutch is shown in section in Fig. 2. It is entirely inclosed in a water tight drum,

above. It will be seen that the propeller when running in the direction with the engine forces its friction wheel directly into the bevel of the drum, and when rotating counter to the engine pulls its friction wheel back against the gear friction bevel, and through the pinion and its opposite gear against the friction bevel of the drum at the other end, thus creating a friction in proportion to its power. Neglecting the skin water friction of the propeller, the latter is directing the entire force developed by the engine against the friction in whatever direction it is moved by the hand lever; in other words, the greater the power of the engine the greater the friction of the clutch to drive the propeller. A remarkable feature about this arrangement lies in the easy disengagement of the friction wheel by a slight movement of the hand lever at the full speed of the engine. The reacting feature of this reversing clutch makes it possible to use very small sizes for very large engines. The clutch shown in

cut has a friction capacity suitable for a 15 horse-power engine. These engines are built by August Mietz, 128 Mott street, New York.

Production of Nickel in 1902.

WASHINGTON, D. C., September 1, 1903.—The annual report of the United States Geological Survey on the production in 1902 of nickel and cobalt, which are treated together, by J. H. Pratt, contains interesting details with regard to the prospecting and development work on deposits in the United States and Canada.

The only nickel ores produced on a commercial scale in the United States during the year were as by-products from ores obtained from Mine La Motte, Missouri. The 20 tons of matte containing nickel and cobalt which were refined at the works of the Mine La Motte Lead & Smelting Company, yielded 5748 pounds of metallic nickel and 3730 pounds of cobalt oxide. This is a decrease of 952 pounds in the production of nickel and of 9630 of cobalt oxide, as compared with 6700 pounds of nickel and 13,360 pounds of cobalt oxide produced in 1901. The quan-

The total imports into the United States of nickel oxide, alloy of nickel with copper and nickel matte during the calendar year 1902 amounted to 33,942,710 pounds, valued at \$1,437,649, as compared with 117,364,337 pounds, valued at \$1,849,620 in 1901. The figures for 1902 include, besides, nickel ore and nickel matte, 752,630 pounds valued at \$251,149, of nickel, nickel oxide and alloys in which nickel is the chief constituent of value; and \$30,128, the value of manufactures of nickel not specially provided for.

Although the importation of nickel in various forms in 1902 was over 83,000,000 pounds less than in 1901, the decrease in value of the imports was only \$411,971. This decrease in quantity can readily be accounted for by the higher grade of matte shipped from the smelters and by the importation of a smaller amount of ore. This will also account for the proportionately small decrease in values.

Recently Discovered Deposits.

Considerable attention has been attracted during the past year to an occurrence of nickel in Idaho. The deposits are on Meadow Creek, Blackbird District, Lemhi

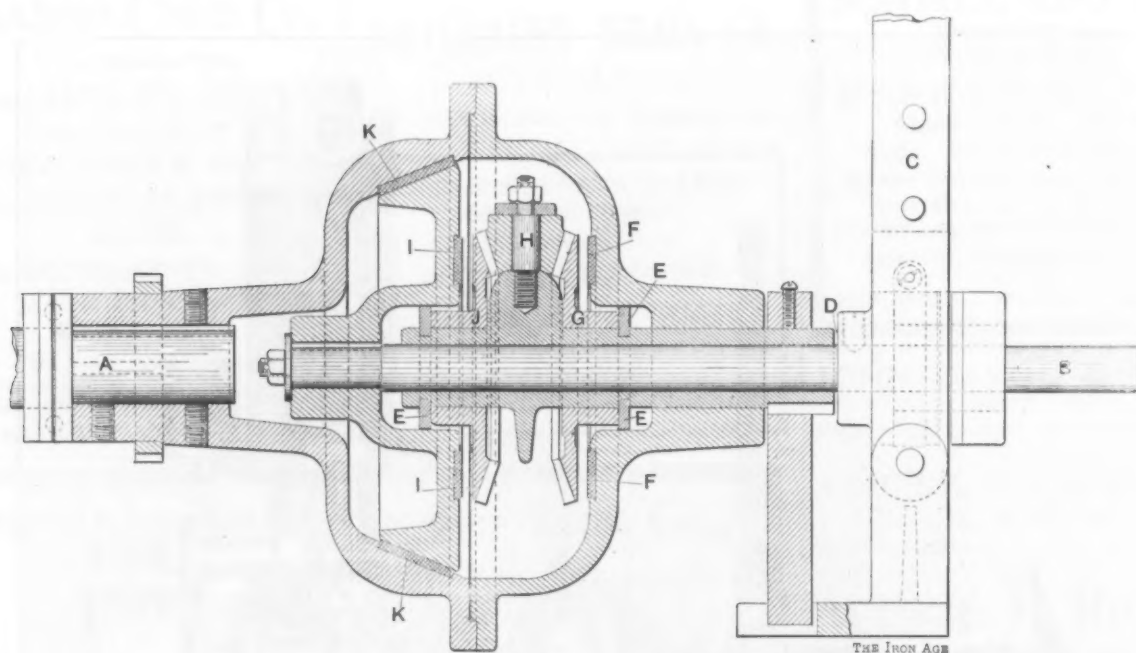


Fig. 2.—Section through Reversing Gear.

THE MIETZ & WEISS MARINE OIL ENGINE.

tity and value of nickel obtained from domestic ores during the past five years is given as follows: 1898, 11,195 pounds, value, \$3956; 1899, 22,541 pounds, value, \$8566; 1900, 9715 pounds, value, \$3886; 1901, 6700 pounds, value, \$3551; 1902, 5748 pounds, value, \$2701.

Canadian Production.

As most of the nickel used in the United States is obtained from Canada, the following table is given to show the amount of nickel ore mined and smelted in Canada and the amount of matte obtained from it for the years 1896 to 1902, inclusive:

Year.	Ore produced. Long tons.	Ore smelted. Long tons.	Matte obtained. Long tons.	Nickel in matte. Pounds.
1896.....	109,097	73,505	9,733	3,897,000
1897.....	93,155	96,093	14,034	3,998,000
1898.....	123,920	121,924	21,101	5,567,000
1899.....	203,118	171,230	19,215	5,744,000
1900.....	216,695	211,960	23,448	7,080,000
1901.....	326,945	270,380	45,134	8,882,000
1902.....	289,538	233,338	24,691	10,693,410

The Canadian Copper Company of the International Nickel Company are entirely remodeling their plant at Copper Cliff, Ontario, Canada, at a cost of about \$500,000. When finished it will be the most complete and best equipped plant of its kind in the world. It will produce a high grade matte, which will be refined in the United States.

County, but on account of their distance from railroad transportation they are being but little developed.

William Beddig of Nampa, Idaho, who has been prospecting in the nickel fields of Idaho, has located what he considers promising deposits, and during 1902 he took out about 12 tons of ore, a part of which was shipped for experimental purposes.

The North Carolina cobalt deposits near Webster, Jackson County, have been worked during the last year and several carloads of ore were shipped for experimental purposes.

Practically no work was done in 1902 on the deposits of nickel and cobalt in Oregon, Washington, Wyoming, Nevada and Arizona, beyond the necessary assessment work. In most cases the deposits are too remote from railroad transportation to make them available at the present time.

At the Mohawk mine, in the Lake Superior copper district, Michigan, an arsenide of copper, nickel and cobalt has been found in some quantity, and it is said to have been treated successfully by the company at their smelter at Hackensack Meadows, N. J.

The world's production of metallic nickel in 1901, the latest year for which figures are available, is given by the Survey as 16,505,636 pounds, valued at \$7,331,723, divided as follows: Canada, 8,882,000 pounds, value, \$4,707,460; France, 3,967,200 pounds, value, \$1,440,000; Germany, 3,656,436 pounds, value, \$1,184,236. W. L. C.

Cold Rolled Steel.*

BY J. J. CRANE.

The paper I have prepared for this evening may seem to some of little importance for a gathering of engineers. For example, let us take watch spring as it is received from the hot mill. This should be as thin as possible, but it does not seem practicable to have it rolled under 0.058, or No. 17 gauge, in lengths of 35 to 40 feet. This steel should not have been more than 0.002 variation from center to edge of a strip $3\frac{1}{8}$ inches wide of high carbon steel. Watch spring is very hard and springy when received from the hot mill and must be annealed before rolling. After annealing, it is placed in a vat of sulphuric acid to remove the scale or oxide; then to bosh or tub of boiling water with lime or sal soda to remove any acid on the steel from pickling.

It is now ready for the rolls for the first roughening. These rolls are of chilled iron or forged steel 9 inches in diameter, 14-inch face, turned in the lathe as near the diameter as possible, then placed in the grinding machine, which gives a high polish. Great care must be taken in grinding not to force the wheel and allow it to run until it clears the roll, which takes from five to six hours for each roll.

This steel is passed through the rolls four times and reduced from No. 17 gauge to 0.045, provided it does not vary too much from center to edge. If it does, you must reduce the variation in the first rolling to make it a success. If this variation is not reduced, it will cause the strip to split through the center or crack on the edges. This may be overcome by shaping the rolls, which is done by using a stick and fine emery. Much time is required scouring and shaping.

After the first rolling, the steel is annealed for the second time, then returned to the rolls. This rolling reduces it to 0.025. It is annealed for the third time, then rolled again. This reduces it to 0.010. Annealed for the last time and finished 0.006, this leaves the steel soft enough to form the springs. The rolling hardens the steel, which makes it necessary to anneal it so often. It is then carefully inspected and gauged, for not more than 1-2000 from center to edge of strip is allowed, then taken to the slitting machine and both edges trimmed.

Shoe shank, hack saw blade, clock spring and corset steels are put through the same process.

For Stamping, Drawing and Nickel Plating.

Soft open hearth basic or Bessemer steel is used. This is ordered different gauges according to the size to be finished in cold mill. This steel is received in coils 65 to 75 feet long and 2 to 6 inches wide. The rolling of this grade of steel does not require the labor and expense connected with watch spring. The majority of it is soft enough for rolling when received. It may be reduced two or three or four gauges, according to the size required. Some coils will measure 700 to 800 feet when finished. It is then inspected, annealed, tested and ready for shipment. The test given to dead soft steel is the bending. It must bend over on itself with the grain and across the grain and show no fracture.

I will enumerate some of the articles this steel is used for: Keys, locks, trouser buttons, sewing machine parts, suspender buckles, door knobs, skate plates, hinges, tubing, rims for cycles and automobiles, also many other articles too numerous to mention.

Cold rolled steel is more accurate to gauge, free from oxide, soft and ductile, and by far superior to hot rolled steel for drawing and stamping.

We also have what we call half hard. This is reduced to within 0.004 or 0.005 of finished size, then annealed and rerolled, inspected and tested to bend to angle 45 degrees with the grain. The steel for nickel plating is reduced about four gauges, and the roller must be very careful that his rolls are in good condition, for any sand holes or flaws in the rolls will leave the impression on the steel.

There is considerable trouble with seams in this grade of steel, and I have known as high as 50 per cent. to be

thrown in scrap. This is no fault of the cold rolling. These seams are in the steel when received, and cold rolling exposes them very plainly and renders it unfit for nickel plating.

Key steel does not require any annealing and is reduced about two or three gauges. This leaves it soft enough to punch and with a fairly good surface. This is then cut into 6-foot strips and shipped.

Pickling.

A few words in regard to pickling. This is the placing of steel in a bath of diluted acid to remove the scale. It is necessary in the operation of cold rolling steel, and it may be hastened by having the acid hot. The steel should not be left in the acid any longer than is necessary to remove the scale. If left in the acid too long it becomes worthless and rotten. The writer thinks that the only way to remove the acid is by placing it in a furnace and baking. The temperature of this furnace should be from 400 to 500 degrees F. This does not discolor the surface. In pickling thin strips care must be taken not to have the acid too hot, or in many cases it will blister the steel. Some of the orders call for a lime finish. This is done by placing the steel in diluted acid; when removed it is placed in a vat of boiling water and from this vat to the lime vat, then dried thoroughly in a furnace to prevent it from rusting, and shipped with the lime on. This coating of lime makes it easy on dies for stamping and drawing.

Annealing.

Great care must be taken with the annealing of cold rolled steel. In order to make it a success the furnace must be well adapted, with a fire box in the side, the flame passing out over the bridge wall. It should always hang to the top, passing down the other side through the checker work and down under the bottom into chimney flue on opposite side into the stack. All cold rolled steel is annealed in round or square boxes, the round for coils and the square for strips. In packing the steel in the boxes a space of about 1 inch is allowed for cast iron turnings, which are placed all around the steel. This prevents the air coming in contact with the steel. It is then placed in the furnace. The time required for annealing depends on the amount and grade of steel. A pan of 8000 or 10,000 pounds of basic open hearth would take from eight to ten hours, and drawn out when the required temperature is reached. As soon as the heat is drawn out of the furnace a gas pipe $\frac{1}{2}$ -inch diameter is inserted in the lid. The gas is now turned on and forces any air that comes in contact with the steel while cooling. There is not a great quantity of gas consumed in this operation because the expanding gas in pans makes a back pressure. Steel annealed in this manner will be bright and ductile when removed from the pans—show no oxidation. This is a brief outline of the general working of cold rolled steel.

Iron Trust in Austria.—A report to the Department of Commerce and Industry by Ethelbert Watts, consul at Prague, says: At the close of the year 1902 the iron industry was in a materially changed condition as compared with the year 1901. The attempt made in 1901 to put the home market on a sounder footing had failed, and reckless competition of the disorganized industry depressed values to such a low level that most establishments must have worked at a loss. Since then the position of this industry has undergone a complete change. The bitter struggle of competition led eventually to a renewed coalition of the iron works in Austria, and an iron trust has been formed, to continue for a period of ten years, which, though it may not be free from fault, is considered unique with regard to the completeness of its organization, being based upon much broader lines than the previous iron syndicate.

An Australian press dispatch dated at Sydney, N. S. W., August 28, states that the Government has decided to call for tenders from manufacturers at home and abroad for the manufacture locally of from 60 to 100 railroad locomotives, estimated to cost \$1,250,000. Four or five years will be allowed for the completion of the work.

* Paper read before Engineers' Society of Western Pennsylvania, May, 1903.

Iron and Steel in Scotland.

GLASGOW, August 20, 1903.—There is not much industrial movement in Scotland to record at this time. Our great staple, shipbuilding, is quieter, rather than more active, and the new contracts reported are of small importance compared with the size of the industry. Then the wages question has once more become a disturbing feature. A recent conference between the marine engineer employers and the officials of the A. S. E. did not result in a settlement, and what promises to be a long controversy has begun, the end of which no man can foresee.

The Iron Market.

Since last letter the pig iron market has been easier, with a small business done, showing a depreciation in Cleveland warrants, there being practically no dealings in either Scotch or hematite. In the face of the severe slump in the stock markets both in New York and here, speculative interest in iron became dormant. The fall in the price of American pig iron had also a depressing effect, but on later advices our market has again improved, and buying on London account has occurred. Business with home consumers continues fairly active, a large quantity of iron being melted in all departments of the trade, while there has been fresh buying on the part of local steel works. The Board of Trade returns show that the exports of pig iron last month amounted to 91,262 tons, as against 112,911 tons for the corresponding month of last year. America took only 19,484 tons, in contrast with 59,442 tons a year ago, but to Italy and other countries increased quantities were shipped. The following are current quotations for various Scotch brands:

	s.	d.		s.	d.
Coltness No. 1.....	72	6	Shotts No. 1.....	66	0
Gartsherrie No. 1.....	62	6	Carron No. 1.....	67	0
Summerlee No. 1.....	67	6	Clyde No. 1.....	62	0
Calder No. 1.....	62	0	Carnbroe No. 1.....	56	0
Langloan No. 1.....	70	6	Monkland No. 1.....	55	3
Eglington No. 1.....	56	6	Glengarnock No. 1.....	61	6
Dalmellington No. 1.....	56	0			

In the Middlesbrough market there is a steady feeling, as makers of Cleveland qualities are fully sold for some time and are frequently not able to deliver their quantities freely. There is, however, a weakening of tone for the time by the less favorable American position, and Cleveland warrants have receded in consequence. Holders of warrants do not appear to be so well assured. The hematite trade, though weaker as regards price, has been more active than for some time, makers having been ready to take less money. No. 3 has advanced under the improved warrant conditions to 46 shillings 9 pence; No. 4 foundry is 46 shillings 6 pence; No. 4 forge, 45 shillings 3 pence; No. 1, 48 shillings 3 pence; mottled iron, 44 shillings 9 pence; white do., 44 shillings 3 pence. The steel and manufactured iron branches show but little change on the week. Demand has been rather quiet. Middlesbrough prices are: Steel ship plates, £5 12s. 6d.; angles, do., £5 10s.; iron ship plates, £6 10s.; iron angles, £6 5s.; common iron bars, £6 10s.; best bars, £7, all less 2½ per cent.; steel rails, £5 5s., net.

In other districts the improvement which was anticipated has not taken place, nor is there any prospect of early change. Both the home and shipping trade is quiet.

There are no further developments in the tin plate trade. Orders for plates are coming in to Wales more freely, and in some cases there has been an advance of 1½ pence per box. Shipments at present are below receipts from works, and stocks have been increased to 159,000 boxes. Newport imported last month over 21,000 tons of steel and iron bars, billets and ingots from Germany and Belgium, as against 5160 tons in the corresponding period last year. These imports have had a weakening effect on Welsh bars, though the superior quality of the latter enables makers to get £4 12s. 6d. per ton.

At a recent meeting of the Zanesville, Ohio, bondholders of the Eastern Tube Company, of that place, it was decided to act as a unit for all further proceedings connected with the present receivership. A resolution

was adopted requesting the owners of the mortgage on the plant, the North American Trust Company of New York, to take such steps as may be necessary to bring about a prompt foreclosure.

The American Locomotive Company.

The second annual report of the board of directors of the American Locomotive Company, covering the operations of the company for the fiscal year ended June 30, 1903, has been submitted to the stockholders by President S. R. Callaway. The report says.

The gross earnings were \$33,105,724.84, an increase of \$6,707,331.32, or 25.4 per cent. over those of the period for the twelve and a half months ended June 30, 1902, as shown in the last report. The expenses were \$28,052,314.90, an increase of \$4,761,098, or 20.4 per cent. over those of the preceding fiscal period. They included, not only the first cost of raw material, the direct expense of manufacture, the maintenance and betterment of property, the local and general administrative and incidental disbursements, taxes, &c., but also 20 per cent. written off from the book value of patterns and drawings and a charge of \$484,369.64, representing positive additions to the company's property.

Out of the resulting net earnings the required annual dividend of 7 per cent. on the preferred stock has been paid, amounting to \$1,750,000, and leaving a surplus of \$3,055,253.15 to be carried to the credit of "profit and loss" account.

The increase in the company's gross earnings is attributable to a much larger product rather than to higher proportionate prices. The officers have conscientiously avoided any advance in the selling price of engines other than such as became absolutely necessary in order to meet the higher cost of labor and of raw material.

In order to take advantage of the exceptional and widespread demands for new locomotives during the past two years extensive purchases of land have been made, capacious new shops of the most modern design have been erected and equipped with the latest and most efficient machinery and tools. Old shops have been remodeled and re-equipped, with the result that the manufacturing capacity of the company has increased fully 50 per cent. over that of the constituent plants at the time of their consolidation into the American Locomotive Company. It is expected that the improvements authorized by the Board of Directors will be completed during the fiscal year now opening.

During the past fiscal year the sum of \$1,627,301.84 has been expended for additions to the company's property, as indicated above, which, together with the sum of \$1,629,227.90 announced in the report of the previous fiscal year, makes an aggregate expenditure of \$3,256,529.74 thus far, all of which will be paid for out of the current income.

The profit of the increased output, which was alone made possible through these additions, has yielded the company a highly satisfactory return on its investment. All this has been accomplished without increasing the capital account.

The company now carries on its books binding contracts for a large number of locomotives for delivery as late as the summer of 1904, all of which it is confident of being able to deliver in strict accordance with its promises.

Following is a summary of operations of the fiscal year ended June 30, 1903, as compared with those of the twelve and one-half months ended June 30, 1902:

	1902-03.	1901-02.	Increase.
Gross earnings.....	\$33,105,724	\$26,398,393	\$6,707,331
Manufacturing, maintenance and administrative expenses.....	\$28,052,314	\$23,291,216	\$4,761,098
Net earnings.....	\$5,053,400	\$3,107,176	\$1,946,224
Interest on bonds of constituent companies, bills payable, &c.....	248,156	105,864	142,292
Profit available for dividend.....	\$4,805,253	\$3,001,312	\$1,803,941
Dividend on old stock, at 7 per cent.....	1,750,000	1,750,000
Surplus.....	\$3,055,253	\$1,251,312	\$1,803,941

Method for Comparative Valuation of Ferrosilicons.

BY GEORGE T. DOUGHERTY, CHICAGO.

To develop a method for analyzing or comparing the values of ferrosilicons at market prices, I select standard Bessemer pig iron as a basis of simple iron value. Bessemer pig is thus taken rather than low phosphorus pig, because the latter commands several dollars more per ton, and ferrosilicons as procured in the market carry the usual Bessemer limits of sulphur and phosphorus, which will not raise the final analysis of the resultant steel by more than a few thousandths of 1 per cent.

Scale of Prices in August, 1903.

	Per gross ton.
Bessemer pig of 0.080 per cent. phosphorus.....	\$21.00
12 per cent. ferrosilicon.....	30.00
25 per cent. ferrosilicon.....	70.00
50 per cent. ferrosilicon.....	125.00
75 per cent. ferrosilicon.....	235.00

Bessemer pig contains about 94.50 per cent. of available iron, while 12 per cent. ferrosilicon contains 86.50 per cent. of iron. Working out the proportion, 94.50 : 86.50 :: \$21 : $x = \$19.20$, which price 12 per cent. ferrosilicon is worth if based solely on iron contents. But as it sells for \$30, then $\$30 - \$19.20 = \$10.80$, the extra price for silicon contents. Multiplying 2240 by 0.12 gives 268.80 pounds of silicon in 1 gross ton, which, divided into \$10.80, gives 0.040, = 4 cents, the value of 1 pound of silicon in 12 per cent. ferrosilicon.

By the same rationale of figuring as above on 25, 50 and 75 per cent. ferrosilicon, as well as on 12 per cent., we ascertain the cost of 1 pound of silicon in

	Cents.
12 per cent. ferrosilicon to be.....	4
25 per cent. ferrosilicon to be.....	9 7-10
50 per cent. ferrosilicon to be.....	10 1-10
75 per cent. ferrosilicon to be.....	13 7-10

Carborundum, an iron-free material, manufactured at Niagara Falls, sells at 4 to 5 cents per pound, but as it is 65 per cent. silicon, 1 pound of silicon from this material will cost 6 cents or more. But, again, in practice, about one-half of it is not utilized or is gone to waste; therefore it will take about 2 pounds of silicon from this source (total cost 12 cents) to do the work that 1 pound of silicon from 12 per cent. ferrosilicon (cost 4 cents) will do.

Aluminum, which is very frequently used to replace or supplement silicon in steel founding, is quoted in the market at 34 cents per pound. Vanadium, a comparatively little known metal, is a most powerful deoxidizer, but at last accounts it commands \$3.40 per pound, which is a prohibitive figure for the steel metallurgist, except possibly in the case of armor plate or other products which can stand fancy prices.

The Youngstown Machinists' Agreement.

In *The Iron Age* of last week mention was made of the fact that the machinists in the Youngstown, Ohio, district made a settlement with their employers on August 25, receiving an advance of 5 per cent. in wages. The agreement, which was entered into by a committee representing the Lloyd Booth Company department of the United Engineering & Foundry Company, the William Tod Company, and a committee representing the International Association of Machinists, provides:

That double time shall be paid for Sundays, Fourth of July, Labor Day, Thanksgiving Day, Decoration Day and Christmas only.

That machinists working on night shift shall receive time and one-quarter for all time worked in excess of nine hours.

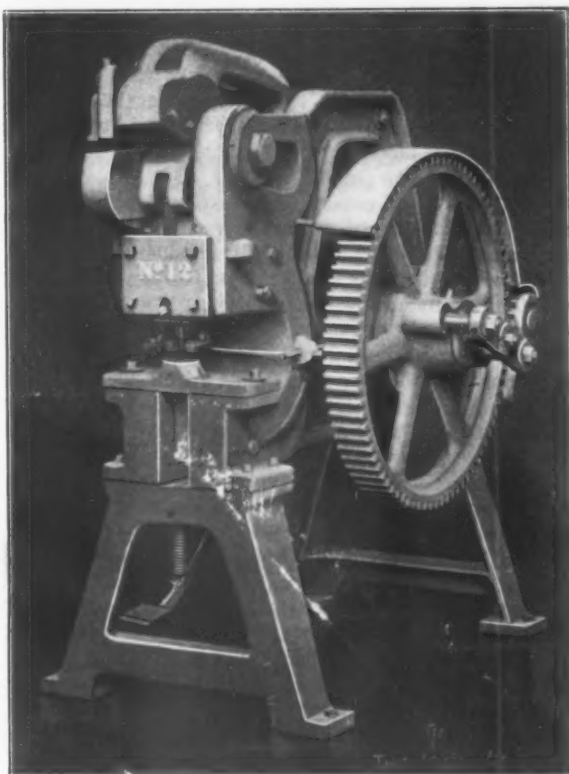
That any difficulties or disputes that may arise in the shops of the parties interested shall upon the request of either party be taken up by the committees representing the parties, each of which shall consist of three members. The decision of a majority vote of this Joint Committee of Arbitration shall be binding. Pending such decision there shall be no cessation of work by strike or lockout, at the instance of either party to the dispute.

That for one year from August 17, 1903, an advance of 5 per cent. shall be paid to each journeyman machinist now in the employ of the parties represented in this agreement. This is to affect all machinists down to apprentices.

That the agreement shall remain in force until August 17, 1904, and thereafter unless either committee gives 60 days' notice to the other that they wish to withdraw or amend it, with the following exceptions: That the clause relating to the 5 per cent. advance shall remain in force until four months from August 17 and thereafter unless the Lloyd Booth Company department of the United Engineering & Foundry Company and the William Tod Company give notice that they wish to amend this clause.

The Rock River Punch and Shear.

The Rock River Machine Company of Janesville, Wis., are building the combined punch and shear here illustrated in three sizes—Nos. 10½, 12 and 17. The No. 12 will punch a ¾-inch hole in ¾-inch iron and shear ¾ x 5 inch in the front jaw, and ¾ x 7 inch flat iron or steel in the lever shears. The machine is so designed that if called upon to do work beyond its capacity it will stall, and thus obviate all danger of breakage. It is equipped with a clutch of the two-pin type, which acts rapidly and is noiseless and reliable in operation. The No. 12



THE ROCK RIVER PUNCH AND SHEAR.

has a 12-inch depth of throat and can be fitted with architectural, stake punching and plate and angle shearing attachments.

The R. D. Nuttall Company.—The R. D. Nuttall Company, Pittsburgh, manufacturers of cut or planed special gears of every description, and gears, pinions and trolleys for electric railway, mine and industrial haulage motors, have found it necessary in the past two years to expend a large sum of money for new machinery to enable them properly to take care of their rapidly growing business in cut gears. They again find it necessary to add 23 of the latest type of gear cutting machines, as well as additional worm gear machinery, mills, lathes and other equipment. In regard to the new gear cutting machinery, it is believed this is the largest single order for this type of machines ever placed. The R. D. Nuttall Company have also made a corresponding increase in the capacity of their power plant. When all of the new machinery is in place the claim made by this company of owning and operating the largest and most complete gear cutting plant in the world will be further substantiated. Their large shops at Fayette and Garrison streets, Pittsburgh, have been operated to full capacity for many months, and they have at the present time a very large number of orders on their books.

Andrew Carnegie's Presidential Address.*

It is 29 years since the Institute held its autumn meeting at Barrow. I have recently looked over the proceedings of that notable meeting. These seem to carry us back almost to the very beginning of cheap Bessemer steel manufacture in America, in which as usual Britain was the pioneer and taught the younger Republic. It was at that meeting your fellow member and Bessemer medalist, Alexander Lyman Holley, then our engineer from the Carnegie Steel Works, read the two papers which first brought to your attention the doings of your American brethren in developing the Bessemer process you had given them.

There are several here to-day who were then present. Such was the impression made upon the meeting that after the discussion, in proposing a vote of thanks, our Nestor, Sir Lowthian Bell, as president, said: "There was no doubt that in America they were doing great things in the manufacture of Bessemer steel, and their friends on the other side of the Atlantic were not averse to telling them what they did, and not only what they did, but how they did it. He thought, under the circumstances, if any member of that Institute was entitled to the thanks of the meeting it was the gentleman who had just read the last two papers."

The effect of these papers, as you know, is a matter of history. Josiah T. Smith of Barrow, one of the greatest of your managers, and subsequently president of the Institute, characteristically said that Mr. Holley would find that, as far as Barrow was concerned, "They would try and do as well, in regard to quantity, as the United States," which struck the right note. There spoke the true Briton, who has done according to his means more than any other, the American not excepted. The record of the great little mother of nations is not equaled by any of her children, although her oldest and biggest seems to inherit his mother's indomitable spirit and the ability to work miracles. In all matters of iron and steel, however, the child has been borne upon the shoulders of the parent. If the Atlantic Ocean had been prairie land, there would have been little left in the world but the conquering old lady and her family, all under one roof, under one flag of a self sustaining Empire under free trade with probably 200,000,000 of our English speaking race, and a home market so big as to give control of neutral markets. No question of protection or preferential tariffs then to disturb us; besides all this we should have been able to enforce peace among nations.

Gentlemen, unfortunately an ocean exists where we should have preferred prairies, but it is traversed in about the same time as the 3000 miles of land between Montreal or New York on the Atlantic and San Francisco and Victoria on the Pacific. Who so bold as to predict that never is our race to succeed in converting the ocean, hitherto a barrier to your extension, into the pathway to reunion of the two once united branches? Not I! My faith is unshakable that some day this will be accomplished, and that instead of being two small islands here alien to the European Continent you will look across the sea to your own children in Canada and the United States, and become once more the mother member of the dominant power of the world. It would have been a case of Britain *versus* all the rest of the world, the world kicking the beam.

Mr. Whitwell participated in the discussion, and asked Mr. Holley to give his opinion on the "from one-half to three-quarters more product which could be got from the converter in America than we were getting in England," which Mr. Holley answered after reading his second paper. It was chiefly owing to his own invention of bottoms in reserve and removable appliances.

There was also at this historical meeting a report, a remarkable production, submitted by David Forbes, foreign secretary to the Institute, upon the progress of iron and steel industries in foreign countries. I naturally turned to see what he had to say about the United States.

Several pages are given to the Pittsburgh district, and what is there recorded carries me back to the days of youth apparently. In 1873 the Pennsylvania Steel Company made 20,000 tons of steel rails. They make that amount in two weeks now. Bethlehem Iron Works were engaged in raising a loan of the enormous amount of £20,000 for the extension of their works, a paltry \$100,000. Five millions would be comparatively less to-day. The great Cambria Iron Works in Western Pennsylvania, near Pittsburgh, were credited with having made no less than 1027½ tons of ingots in the week ending September 26, the largest quantity ever made in a week—a day's work nowadays. Two new blast furnaces were being built in Ohio, the capital of the company being all Scotch, and it was proposed to call the iron Scotch-American pig. This isn't a bad brand—either of men or iron. It is noted that the total production of pig iron in the United States in 1872 was 2,897,000 net tons, and in 1873 just about the same; to-day it is approaching 20,000,000 tons per annum. The product of steel, nearly 15,000,000 tons, is greater than the rest of the world.

The progress of Germany and Britain has also been great. Britain made 643,000 tons of steel in 1874, and last year 1,826,000 tons. Germany made 362,000 tons in 1874, last year 6,394,000. In 1874 Britain made 6,054,000 tons of pig iron, Germany 1,906,000 tons. Last year they made 8,518,000 and 8,403,000 tons, respectively. In 1874 the world was producing nearly 14,000,000 tons of pig iron and 280,000,000 tons of coal. Now there is being produced 41,000,000 tons of pig iron and 780,000,000 tons of coal.

Another item—Mr. Forbes is informed that for the last seven months natural gas had been utilized in Pittsburgh in one of the mills. The largest output for a furnace then known was during the week ending September 7, 1874—702½ tons, 100 tons per day. When our Lucy Furnace made 100 tons in one day the world thought the limit was surely reached. Two new Carnegie furnaces have recently averaged 650 tons each per day for months at a time.

Records are given of various enterprises which promised brilliant results, but which are already things of the past. Perhaps the most noticeable point of all is that not the slightest mention is made of the Carnegie Steel Company—so much a thing of yesterday it is. It was making iron and building bridges and had also furnaces in operation, which were visited by the late Thomas Whitwell, but it was scarcely worth noticing, as its steel works were then only under construction. So rapidly do things grow in the new land!

You have noticed that the blast furnace product increased more than six times, and also the rail mill's product about the same. The work of a week is now done in a day, but great as is that contrast, here is one still greater. There have been made and sold without loss hundreds of thousands of tons of 4-inch steel billets at 3 pounds for a penny. Surely, gentlemen, the limit has been reached here. I think it has, and it is doubtful if ever a lower price can be reached for steel. On the contrary, there is every indication that period after period the price of steel is to become dearer owing to the lack of raw materials. To make that 3 pounds of steel, at least 10 pounds of material were required—3 pounds of coke, mined and transported 60 miles to the works; 1½ pounds of lime, mined and transported 150 miles, and 4½ pounds of iron stone, mined at Lake Superior, and transported 900 miles to Pittsburgh, being transferred twice, once from cars into the ship, and again from the ship into the railway cars. How it was done I cannot pretend to tell you, but I know the figures are correct. But every time I repeat them I doubt their possibility. This was done during the day of depression, when everything was at the lowest. Costs are several dollars per ton higher to-day, during this period of boom in America.

Gentlemen, such is the contrast between 1874 and 1903. What is it to be 29 years hence? What changes are to come? I have tried to imagine some of its features. It is scarcely possible that this country can increase its product of iron and steel materially. Let us hope that the product will not be decreased. The vital element in the matter is, as we all know, the supply of iron ore. Many

* Delivered before the Iron and Steel Institute, Barrow-in-Furness, September 1, 1903.

of you are conversant with the situation here. I only know what I learn from others, but undoubtedly the attention of the iron and steel manufacturers should be directed to this question, Where and how can they obtain a supply of iron ore?

Nor is it a question which the manufacturer of America can safely neglect. It was because it forced itself so strongly upon us that we secured such an abundant supply of the best ore obtainable. For 60 years, I think, the United States Steel Corporation are supplied at their present rate of consumption, but 60 years is as nothing in the life of a nation. It is upon future discoveries of iron ore that the future of cheap steel manufacturing, even in America, depends. There are immense deposits in now inaccessible parts. In Utah, for instance, and in Southern California large deposits have been found, so that steel will continue to be manufactured, but it would not surprise me if its cost was very greatly advanced in the future. It seems almost miraculous that such an article as steel could be produced and sold without loss at 3 pounds for a penny. I am convinced that this is a thing of the past. It will be a question of increased cost and therefore of increased price, so that neither Britain nor America need fear that steel manufacture will be wholly lost; the world will gladly pay the increased price necessary to obtain it. During the next half century, it seems that America is to increase her output at a tremendous pace. The output of Britain will perhaps remain stationary or even increase somewhat if developments in Norway and Sweden prove satisfactory.

Gentlemen, even if this Barrow meeting should fail to rank in importance historically with the first one, I am sure that in the warmth of welcome received, in the enjoyment of the occasion and in the meeting of one with another, the records will not fail to show that 1903 compared favorably even with its epoch making predecessor.

Drawback Decisions.

The Treasury Department has rendered a number of decisions during the past week relative to the allowance of drawbacks on manufactures of iron and steel, as follows:

On the exportation of pumps and pumping machinery manufactured in part from imported pig iron by the Deane Steam Pump Company of Holyoke, Mass., the decision provides that in liquidation the quantity of imported pig iron which may be taken as the basis for the allowance of drawback may equal the quantity declared, but in no case shall it exceed 75 per cent. of the exported castings, and to the quantity so ascertained may be added 4.16 per cent. to compensate for wastage.

The regulations of March 28, 1894, establishing a rate for allowance of drawback on steel clock spring material, rolled, tempered, polished and prepared for cutting into lengths suitable for clock springs manufactured from imported steel wire rods, are amended so as to provide for drawback on such manufactures by the Washburn Wire Company, successors to R. H. Wolff & Co., Limited.

The regulations of December 29, 1902, establishing a rate for allowance of drawback on babbitt metal, with the use of lead and antimony wholly imported, are extended as far as applicable to cover similar exportations by Marks Lissberger & Son of New York, manufactured in part from imported lead and antimony.

The regulations of January 31, 1902, establishing a rate for allowance of drawback on solder of various grades and numbers manufactured wholly with the use of imported lead and tin are extended as far as applicable to cover exportations of similar merchandise manufactured for the order and on the account of Tatham Brothers of New York, provided that the percentages of imported lead and tin which may be taken as the basis for allowance of drawback shall in no case exceed for each grade or number of solder exported those named for corresponding descriptions in the schedule attached to and forming part of the manufacturers' sworn statement dated August 12, 1903.

On exportation of sad irons manufactured by Bless & Drake of Newark, N. J., in part from imported pig iron, the handles being made of domestic wrought iron, the

stipulation is made that in liquidation the weight of imported pig iron which may be taken as the basis for allowance of drawback may equal the quantity consumed as declared, after official verification, but in no case shall it exceed the weight per dozen of the various sizes as follows:

Size, number.	Pounds, per dozen.	Size, number.	Pounds, per dozen.
1.....	35.5	5.....	50
2.....	42.5	6.....	62
3.....	51	7.....	75
3½.....	58.5	8.....	85
4.....	43	9.....	96

To which may be added not to exceed 7 per cent. to compensate for wastage.

The Mills Recognizing the Amalgamated.

A complete list of the companies that have signed the Amalgamated scale since July 1, which includes all of the mills where Amalgamated lodges exist, except the Ashland Sheet Mill Company, Ashland, Ky., and the McKeesport Tin Plate Company, McKeesport, Pa., where strikes exist, and the Frankstown mill of the National Tube Company, which is idle, is as follows:

American Steel Hoop Company.
American Tin Plate Company.
American Sheet Steel Company.
Republic Iron & Steel Company.
Pennsylvania department, National Tube Company.
Steel Spring Company, Detroit, Mich.
Kansas City Nut & Bolt Company, Kansas City, Mo.
Standard Chain Company, Columbus, Ohio.
Tyler Tube & Pipe Company, Washington, Pa.
Zuz & Co., Limited, Pittsburgh, Pa.
Lockhart Iron & Steel Company, McKee's Rocks, Pa.
Byers Iron Works, Pittsburgh.
Cleveland Hardware Company, Cleveland.
Alcania Company, Avonmore, Pa.
Pittsburgh Forge & Iron Company, Pittsburgh.
Parkersburg Iron & Steel Company, Parkersburg, W. Va.
Southern Car & Foundry Company, Anniston, Ala.
Wayne Iron Works, Brown & Co., Incorporated, Pittsburgh.
Zanesville Iron Company, Zanesville, Ohio.
Monongahela Iron & Steel Company, Pittsburgh.
Colonial Steel Company, Monaca, Pa.
Niles Iron & Steel Company, Niles, Ohio.
Carnahan Tin Plate Company, Canton, Ohio.
National Steel Company, Mingo Junction, Ohio.
Neal Brothers' Sheet Mill, Pittsburgh.
Howe-Browne Works, Crucible Steel Company of America, Pittsburgh.
Ohio Falls Iron Works, New Albany, Ind.
G. Taylor Tin & Black Plate Company, Cumberland, Md.
Eagle Horseshoe Company, South Milwaukee, Wis.
Muskingum Valley Steel Company, Zanesville, Ohio.
American Rolling Mill Company, Middletown, Ohio.
Empire Rolling Mill Company, Cleveland, Ohio.
Emlyn Iron Works, East Chicago, Ind.
Republic Iron Works, Pittsburgh.
Westerman & Co., Lockport, N. Y.
Empire Iron & Steel Company, Niles, Ohio.
McClure Company, Washington, Pa.
Ohio Rolling Mill Company, Findlay, Ohio.
Tennessee Coal, Iron & Railroad Company, Bessemer, Ala.
Weller Rolling Mill & Forge Company, Anniston, Ala.
Youngstown Iron, Sheet & Tube Company, Youngstown, Ohio.
Ewald Iron Company, Louisville, Ky.
Lake Erie Iron Company, Cleveland.
American Car & Foundry Company, Detroit, Mich.
National Enameling & Stamping Company, Granite City, Ill.
Stewart Iron Company, Limited, Sharon, Pa.; Waynesburg, Pa.
Licking Rolling Mill, Covington, Ky.
Youngstown Iron & Steel Roofing Company, Youngstown, Ohio.
Canonsburg Steel & Iron Works, Canonsburg, Pa.
Sharon Steel Hoop Company, Sharon, Pa.
Highland Iron & Steel Company, Terre Haute, Ind.
National Roofing Mill Company, Hartford City, Ind.
N. & G. Taylor's Sheet Mill, Cumberland, Md.
Stark Rolling Mill Company, Canton, Ohio.
Griffiths Charcoal Iron Mills, Washington, Pa.
American Rolling Mill Company, Muncie, Ind.
Pope Tin Plate Company, Steubenville, Ohio.
Kittanning Iron & Steel Mfg. Company, Kittanning, Pa.
Pittsburgh Steel Hoop Company, Glassport, Pa.
Newport Rolling Mill Company, Newport, Ky.
Inland Steel Company, Indiana Harbor, Ind.
Helmbacher Forge & Rolling Mill Company, St. Louis, Mo.
Chicago Steel Mfg. Company, Hammond, Ind.
Crescent Puddle Mill, Crucible Steel Works of America, Pittsburgh.
Laughlin Nail Company, Martin's Ferry, Ohio.
Top Mill, sheet department, Wheeling Steel & Iron Company, Wheeling, W. Va.
Louisville Bolt & Iron Company, Louisville, Ky.

Economy of Steam in Reversing Mill Engines.

The Rottman Valve Gear.

Few American engineers have given much thought toward economy of steam in reversing mill engines. The accompanying diagram, Fig. 1, is an actual average indicator card from a blooming mill engine in one of the most prosperous steel plants in this country. It is probably but little worse than our average practice. In Germany coal costs more than here; hence they are far ahead of us in fuel economy. Many, perhaps most, of their reversing mill engines are condensing, and they are now also compounding. Compounding has been tried here and failed, largely for the following reasons:

1. In starting, the high pressure cylinders only were available and there was not enough power.
2. When the steam did reach the low pressure cylinders there was too much power.
3. When the bloom left the bite of the rolls the engine would jump dangerously, even with the throttle instantly closed, because of the large amount of steam remaining in the steam pipes, in the high pressure cylinders, in the receiver and in the low pressure cylinders.
4. All this steam left in the engine after each pass was a total loss. With an engine making but one to ten revolutions between reversals, it is obvious that the extra steam thus lost must largely eliminate the economy expected from compounding.
5. Much time was lost in stopping, reversing and starting.

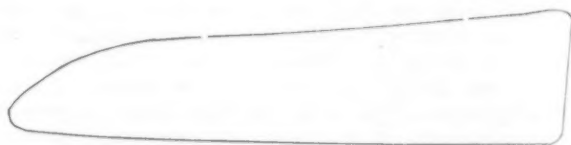
A German firm* recently took a contract to rebuild a good condensing blooming mill engine and were not to get their pay until the new engine clearly proved that it had paid for itself. The mill had 32-inch rolls. The old engine had cylinders 59 inches in diameter by 50 inches stroke, direct connected. The new cylinders were 47 and 72 inches diameter by 50 inches stroke, using the same condenser as was used on the old engine. Only four weeks were required to make the change. The reconstructed engine proved an instant and complete success. It has been running 24 hours per day steadily ever since the first start, with no delays charged to the engine. The engine will start and stop as promptly and easily as a simple noncondensing engine. This apparently difficult result was readily obtained by the use of the new Rottman valve gear.

With this gear the point of cut off in the low pressure cylinder is determined by the position of the high pressure throttle valve. When the high pressure throttle is wide open the low pressure cylinder takes steam nearly full stroke. As the throttle is closed the point of low pressure cut off comes correspondingly earlier and earlier until when the throttle is entirely closed the point of low pressure cut off becomes zero. Any steam then in the high pressure cylinder or the receiver is thus confined just where it is wanted to make a strong start a second later. This is clearly shown in Fig. 4, which gives continuous diagrams from both the high and low pressure cylinders. These cards show irreproachable curves for the high pressure cylinder during the working period. On closing the throttle the expansion line instantly drops below the atmospheric line. Closing the throttle also sets the low pressure cut off at zero. This means that the steam cannot escape, and the receiver pressure must rise until the engine stops, as the high pressure cylinders are now acting as pumps and also as brakes—that is to say, the momentum of the engine and roll train is taken up to be again utilized as work. The high pressure steam pistons pump the steam into the receiver, so that again full pressure will be found in low pressure cylinders when the engine starts afresh in either direction, as can be clearly seen from the low pressure diagrams. Thus the momentum of the engine and roll train, which formerly was simply lost, is now recovered. This also means a considerable saving. This saving will be further evident when taking into consideration the exceedingly small number of revolutions made by a blooming mill engine between reversals.

In rebuilding the engine the high pressure valve motion is not necessarily changed. The low pressure cylinder

has a main valve with riding cut off valves, balanced. The main valve is driven from the link, as usual. The cut off valves are driven from an extra eccentric or by direct lever connection with the tail rod (as they move exactly opposite to the piston). The valves at each end of the cylinder are separate, and their distance apart determines the point of cut off. This style of cut off, adjustable by hand or by governor, is familiar to all. Rottman has a very simple and nearly frictionless method of adjusting these valves and connects the adjusting lever directly with the high pressure throttle.

In order to make comparisons between the new and the old engines that should prove mutually satisfactory, a series of continuous indicator diagrams were taken both before and after compounding, as here shown. These long diagrams showed the steam consumption for each revolution of the engine for the entire period of rolling—say a 2-ton 12-inch I-beam. The results of the tests are as follows: The saving in consumption of steam was ascertained to be 18½ per cent. for light work, 30 per cent. for average work and 45 per cent. when rolling short heavy sections. On regular work the savings were



THE IRON AGE

Fig. 1.—Average Indicator Card from a Blooming Mill Engine.

ECONOMY OF STEAM IN REVERSING MILL ENGINES.

found to run from 20 to 30 per cent.—say 25 per cent. average. In this case 25 per cent. meant well over \$20,000 per year saved. What would the saving have been in replacing the engine from which the card, Fig. 1, was taken? This first engine was such a complete success that neighboring steel plants promptly entered orders for four other similar engines.

Pittsburgh Coal Company.

Statements have recently appeared in the daily press at Pittsburgh to the effect that control of the Pittsburgh Coal Company would soon pass into the hands of the Pennsylvania and Baltimore & Ohio railroads. At a meeting of the Employees' Accident, Death and Pension Fund Association, composed of employees of the Pittsburgh Coal Company, Francis L. Robbins, president of the company, made a lengthy address, which in part is as follows:

I want to say, referring to some newspaper articles which have appeared from time to time in the past few weeks (and I might say that no one can make more mischief than the man that assumes he knows something when he knows nothing) with regard to the reported change in ownership and management of the Pittsburgh Coal Company, that there has been no change whatever, nor is any contemplated in the ownership of the company. Some of us, already large stockholders, have disposed of holdings in other interests to take more stock, believing Pittsburgh Coal Company stock to be the best investment in this country. There has been no change in officers or employees of the company, nor will there be, and every official and every employee is assured of his position so long as he does his duty.

Foreign Trade of Germany.—The following table gives the value of Germany's foreign trade for the past five years:

Year.	Imports.	Exports.
1898.....	\$1,294,720,000	\$954,618,000
1899.....	1,376,592,000	1,039,584,000
1900.....	1,438,234,000	1,131,214,000
1901.....	1,358,980,000	1,074,094,000
1902.....	1,359,456,000	1,191,666,000

In the foreign trade of Germany the imports of raw materials have increased, while the exports show an increase of manufactured wares.

* Ehrhardt & Sehmer of Saarbrücken.



Fig. 2.—Part of Continuous Diagram of Reversing Engine Before Rebuilding.



Fig. 3.—First, Second and Third Passes from a Continuous Diagram from a Twin Tandem Compound Reversing Engine with Kottman Valve Gear.

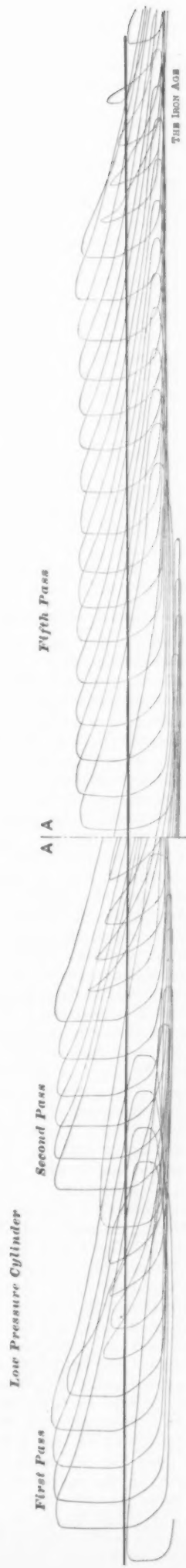


Fig. 4.—First, Second and Fifth Passes from a Continuous Diagram from a Twin Tandem Compound Reversing Engine with Kottman Valve Gear. (The complete diagram is over 4 feet long.)

ECONOMY OF STEAM IN REVERSING MILL ENGINES.

Notes from Great Britain.

The Markets.

LONDON, August 22, 1903.—There is practically no improvement to report on the week's operations. Foreign competition has slightly eased off, but Germany and America are securing orders for tubes, both of iron and steel. At this time of the year substantial contracts for seamless tube for cycle building are given out, and a number are now under negotiation. Prices generally are upheld, not because of the state of the market, but owing to the comparative dearth of pig iron and steel billets, for which the scarcity of coke is responsible.

An ominous feature of the situation is that in many of the mills and blast furnaces and forges irregularity of employment is becoming observable. Too much importance need not be attached to this fact at this time of the year, but it is none the less true that this has not occurred in the same sense for four or five years. A year ago there was a setback, which recovered itself owing to the American demand. This has now slackened off, and the outlook for the autumn trade is certainly not reassuring.

In the Midlands there is an agitation among the blast furnacemen in favor of the three-shift system. The employers are of opinion that this means paying more wages for scarcely any more work, and are emphatic that the conditions of trade will not bear it. Whether the men will carry the agitation to an extreme issue it is as yet premature to surmise. Prices are the same as last week and need not be recapitulated.

Revival in the German Iron and Steel Industry.

After two or three years of severe depression a perceptible revival has begun in the German iron and steel industry. One finds confirmation of the improvement in the annual reports of the leading companies for the year 1902-3, which are just now beginning to make their appearance. It appears that the Rothe Erde Iron & Steel Works Company of Aix la Chapelle have been able to increase their dividend from 20 per cent. in 1901-2 to 30 per cent. in the past financial year; the Hoesch Iron & Steel Company of Dortmund, who made no distribution whatever last year, now propose to pay 8 per cent.; the Mannstaedt Rolling Mills Company and the Aplerbeck Iron Works Company, both of whom passed their dividends a year ago, intend to pay 6 per cent. each on the present occasion; while the Hoerde Mining & Iron Works Company, who were unable to make any profit in 1901-2 for either the ordinary or the preference share capital, are at present in a position to pay 4 per cent. on the latter class of capital for the past year. It is expected that a similar improvement will be noticed on the publication of the reports of other iron and steel companies during the next few weeks.

A second noteworthy proof of the revival is afforded by the large amount of money which is being expended on the erection of new works or the extension of the existing plant and machinery, for it cannot be thought for one moment that heavy capital outlay would be incurred by the companies and firms unless they were convinced that an era of prosperity has once more dawned upon the industry, although hopes are mainly centered upon the export trade. As examples of development it may be mentioned that the Krupp Steel Company are expending £1,100,000 on the establishment at Rhelnshausen of three further blast furnaces, basic steel making plant and various rolling mills, &c.; the Hoesch Iron & Steel Works Company are having a new bar rolling mill built at Dortmund, and are extending their gas power plant (blowing engines) for utilizing on a larger scale the waste blast furnace gases according to the system which is becoming general in Germany, and which is claimed to be more economical than the use of steam engines; and the Bethlen-Falva Iron & Steel Company of Schwientochlowitz have just completed new rolling mills, which will be started in the course of a few days. In addition to these there may be cited, among others, the large extensions which are being carried out at the Rothe Erde steel works, while even as far distant from industrial Westphalia as Dantzig the Northern Electric-

ity & Steel Works Company are now completing Siemens-Martin steel works and rolling mills for the production of 60,000 tons per annum.

Further evidence of their recovery is to be found in the preparations which the German iron and steel firms are making to strengthen their position. The Moselle Iron Works Company have just acquired the Belgian iron works, iron ore mines and coke works at Maizieres, formerly owned by the Hauts-Fourneaux de la Moselle, while the Belgian Andun le Tiche Blast Furnace Company have been absorbed by the Rothe Erde Steel Company of Aix la Chapelle. It is impossible to foresee where this new departure will lead, but it will be obvious that the Germans are preparing themselves for the coming contest for the supremacy of the iron and steel markets of the world.

Warring Opinions.

I observe that J. Stephen Jeans, at the Montreal congress, remarked that it would be difficult to bring round the iron and steel trades of this country to a belief in the Chamberlain fiscal scheme. My own view is that the majority of the iron and steel masters of this country are free traders. A notable instance is that of Hugh Bell of the Clarence Iron Works, Middlesbrough, who is taking an active part in the movement against Joseph Chamberlain.

Guest, Keen & Nettlefolds.

The balance sheet of one of our largest combines should prove interesting reading. I refer to Guest, Keen & Nettlefolds. After making due provision for bad and doubtful debts, there is a profit of £410,180, to which is added the amount brought forward, £129,119, making a balance available for dividend of £539,299. Deducting from this the amount paid for debenture interest for 12 months, the interim dividend on the preference and ordinary shares, amounting to £160,952, there remains a sum of £378,347, which is appropriated thus: A dividend on preference shares at the rate of 5 per cent.; a dividend on ordinary shares at the rate of 10 per cent.; £150,000 to reserve; £137,097 carried forward.

Shipbuilding Notes.

The directors of Palmer's Shipbuilding & Iron Company of Jarrow have issued a general invitation to officials and employees to become shareholders in the company on easy terms, the extent of the holding being fixed at £400 in the case of the former and £200 in the case of the latter. Deposits of from 1 shilling to £1 will be deducted by arrangement from employees' weekly wage, except, if requested, from short pays following holidays. Officials will be allowed to deposit up to £2 weekly. On the money invested 4 per cent. interest will be allowed, and this will be added to the depositor's account, or, if preferred, will be paid in cash. As an encouragement to invest, the directors agree to dispense with the registration charge on the purchase of shares. The nominal prices of these are: Preference, £1; A shares, £1, and B shares, 16 shillings 8 pence. Deposits may be withdrawn up to one-half on seven days' notice, and the whole on 14 days' notice. In special cases no notice will be required, and persons leaving the service will have their deposits returned after 14 days.

With the launch of H. M. S. "Dominion" at Barrow, the whole of the King Edward VII class of battle ships will be afloat. Their successors on the stocks are not yet started and will not be until the commencement of another financial year, in April next. There are to be three of the new class, to be of no less than 18,000 tons, or about 1500 tons heavier than the King Edward class. The most notable departure in their construction will be seen in the armor plating for the sides of the hull. A belt of 10-inch Krupp steel, tapering away to 6 inches, will be continued the whole length of the broadside. This is the first time this has been attempted in the battle ships of any country. Four submerged torpedo tubes, four 50-ton wire guns, eight quick firing 27-ton guns, and 12 6-inch guns are included in the armament, a battery of enormous capacity. A speed of 19 knots, in spite of immense weight, will be stipulated for.

S. G. H.

Production of Abrasives in 1902.

WASHINGTON, D. C., September 1, 1903.—The output of abrasive materials in 1902 exceeded that of any previous year both in quantity and value, according to the annual report of the United States Geological Survey, which has been prepared by J. H. Pratt. The materials treated in this report include oilstones and whetstones, grindstones and pulpstones, buhrstones and millstones, pumice, infusorial earth and tripoli, crystalline quartz, garnet, corundum and emery, carborundum, crushed steel, artificial corundum and adamite. The total value of these products in 1902 was \$1,322,894, as compared with \$1,194,772 in 1901 and \$1,208,073 in 1900. While the aggregate amount of these abrasives produced each year is increasing, there is a notable variation in the production of the different kinds of material. As their use is to a large extent dependent on the growth of certain manufacturing industries there will be a change in their production corresponding to the increase or decrease in these industries.

Oilstones and Whetstones.

There was a decided increase in the production of oilstones and whetstones in 1902, the value of which amounted to \$219,172, an increase of \$60,872 over \$158,300, the production in 1901. This production was confined to the States of Arkansas, Michigan, Indiana, Ohio and Kentucky, in which the material used was sandstone, and New Hampshire and Vermont, in which the material used was a quartz-schist. In 1902 the imports amounted to \$56,456, consisting principally of razor hones from Belgium and Germany, and of "Turkey" oilstones from France and Italy.

Grindstones.

The States producing grindstones in 1902 were Michigan, Ohio, West Virginia and New York, with by far the largest amount from Ohio. Pulpstones were produced in Ohio alone. The total value of all kinds of grindstones produced in 1902 was \$656,822, which is \$76,119 greater than their value in 1901, which was \$580,703. The production of 1900, valued at \$710,026, is still the largest production recorded for any year. In comparing the values of the productions of the earlier years with those of the last few years it must be borne in mind that the price per ton has decreased from \$15 to \$8 to \$10, and that, therefore, the tonnage of grindstones used in the last four years is greater than that of any year before. Of the value of the production of 1902, \$656,822, the sum of \$23,088 is due to pulp stones, an increase of \$4288 over the value in 1901, which was \$18,800.

Corundum and Emery.

There is a constant increase in the demand for such abrasives as corundum and emery, which is due to the large increase in manufacturing, especially of agricultural machines, and also to the improved methods that have been devised for manufacturing emery and corundum stones and wheels of all shapes and sizes. That the supply could readily exceed the demand is very evident when it is considered that there are only about 16,000 tons of corundum and emery used in the United States. Of this amount, however, about 10,000 tons are imported, so there is room for a large increase in the domestic production of these abrasives. At the present time there are less than 500 tons of corundum used. This is not due to the small demand for it but to the lack of this material on the market. If the price is maintained at 8 to 10 cents per pound there will be but a relatively small amount of corundum used; but with a slight decrease in price there will be a great increase in the use of corundum, which will be at the expense of the emery. At the same time, with a decrease in price, the more favorable must be the location of the deposits for mining and for railroad facilities in order to bear the competition with the emery. With the known occurrences of corundum in the United States there should be no difficulty in such production of it as fully to satisfy the market's demand.

There was no production of corundum in the United States in 1902, except of the emery variety, and the production of emery was confined to the same localities as for 1901—the mines at Chester, Mass., and Peekskill, N.

Y. The total production during 1902 was 3497 tons, valued at \$95,135, a decrease of 808 tons in quantity and of \$50,905 in value as compared with the production of 4305 tons, valued at \$146,040, in 1901. The imports of corundum and emery amounted altogether in value to \$214,842 in 1902, as compared with the production in 1901, viz.: \$294,999, a decrease of over \$80,000 in value.

Carborundum.

There was a slight decrease in the amount of carborundum produced in 1902 as compared with that of 1901, which was due to interruptions during the early part of 1902 in the Carborundum Company's supply of electrical current and their inability during the latter part of the year to obtain a sufficient supply of raw materials—a result of the anthracite coal strike. If it had not been for these obstacles the production would have been considerably increased over that of 1901. It amounted in 1902 to 3,741,500 pounds, a decrease of 96,675 pounds, as compared with the production of 3,838,175 pounds in 1901. This is the first year since carborundum began to be manufactured that there has not been a large increase over the production of the year before. In 1903 there will undoubtedly be a large increase over last year's production. Much of the carborundum that is manufactured is now exported. The value of the carborundum varies from 8 to 10 cents per pound.

Crushed Steel.

The production of crushed steel by the Pittsburgh Crushed Steel Company in 1902 amounted to 735,000 pounds, as compared with 690,000 pounds in 1901. The value of this product is 5½ cents per pound, f.o.b. Pittsburgh. The production of crushed steel, which is used largely for the building trades, is apt to fluctuate with their condition. New uses are being found for the different grades of crushed steel, and some grades are meeting with considerable success. The finer grades of crushed steel, known as "steel emery" and "rouge," are used in considerable quantity by the glass trade.

Artificial Corundum.

The manufacture of artificial corundum from bauxite, which was recently started by the Norton Emery Wheel Company, has been carried on by them at their plant at Niagara Falls during most of the year 1902. Thus far their manufactured product has been used entirely by themselves, and none has been put on the market as raw material. This artificial corundum is reported to give very good satisfaction, and the company expect in the near future to produce this material to the full capacity of the plant. It will then undoubtedly be put on the market.

Adamite.

Another artificial abrasive that has recently been introduced to the market is adamite, which at the present time is being manufactured at Vienna, Austria, and is handled in this country by the Adamite Abrasive Company, who crush and grade the raw material received from Germany at their plant at North Tonawanda, N. Y. The company intend in the near future to erect a plant at North Tonawanda to manufacture adamite. This material makes a hard and tough abrasive, but no comparative tests as to its abrasive efficiency are as yet available. It breaks with a rough fracture, which is favorable for sustaining a good cutting edge. W. L. C.

The Wm. B. Scaife & Sons Company of Pittsburgh, Pa., sole manufacturers of Scaife and We-Fu-Go water softening and purifying systems, will be represented in the future in Philadelphia by Duncan W. Patterson, with offices in the Harrison Building, corner Fifteenth and Market streets, succeeding Mr. Fierstine, whose offices were in the Bourse Building. Mr. Patterson for the past two years has been handling the Bachman system of water purification, a continuous system, treating hot feed water under pressure, has made a number of installations at some of the large iron works, and is thoroughly familiar with water purification in all its branches. He will have charge of all the work of the company in Eastern Pennsylvania, Southern New Jersey, Delaware, Maryland and Virginia in their water purifying department.

The Inland Steel Company's Indiana Harbor Works.

In constructing and equipping the Indiana Harbor Works at Indiana Harbor, Ind., the Inland Steel Company of Chicago have expended \$1,650,000. It will be re-

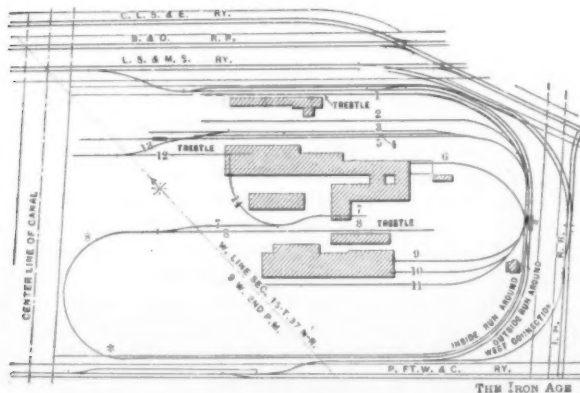


Fig. 2.—Track System.

road and the Pittsburgh, Fort Wayne & Chicago Railway, and on the northeast by the Chicago, Lake Shore & Eastern, the Baltimore & Ohio and the Lake Shore & Michigan Southern railways.

Composition of the Works.

By reference to the ground plan, Fig. 2, will be noted the relative position of the various buildings, the pig iron and heavy scrap storage yard being located in the northwestern portion, and the blast furnace reserve in the southwestern portion, fronting on the waterway to Lake Michigan.

In planning and equipping the plant first consideration was given to the economical handling of both raw material and the finished product consistent with the best steel mill practice, and to that end the most modern, standard and in some cases special labor saving machinery has been installed, to which reference will be made in the detailed consideration of the different buildings.

It will be noted that the major buildings cover an open hearth plant, a blooming mill, a bar mill, a sheet mill, boiler and power plant and gas producers. There are a number of minor buildings, including chemical laboratory, stock house, machine, pipe, blacksmith and carpenter

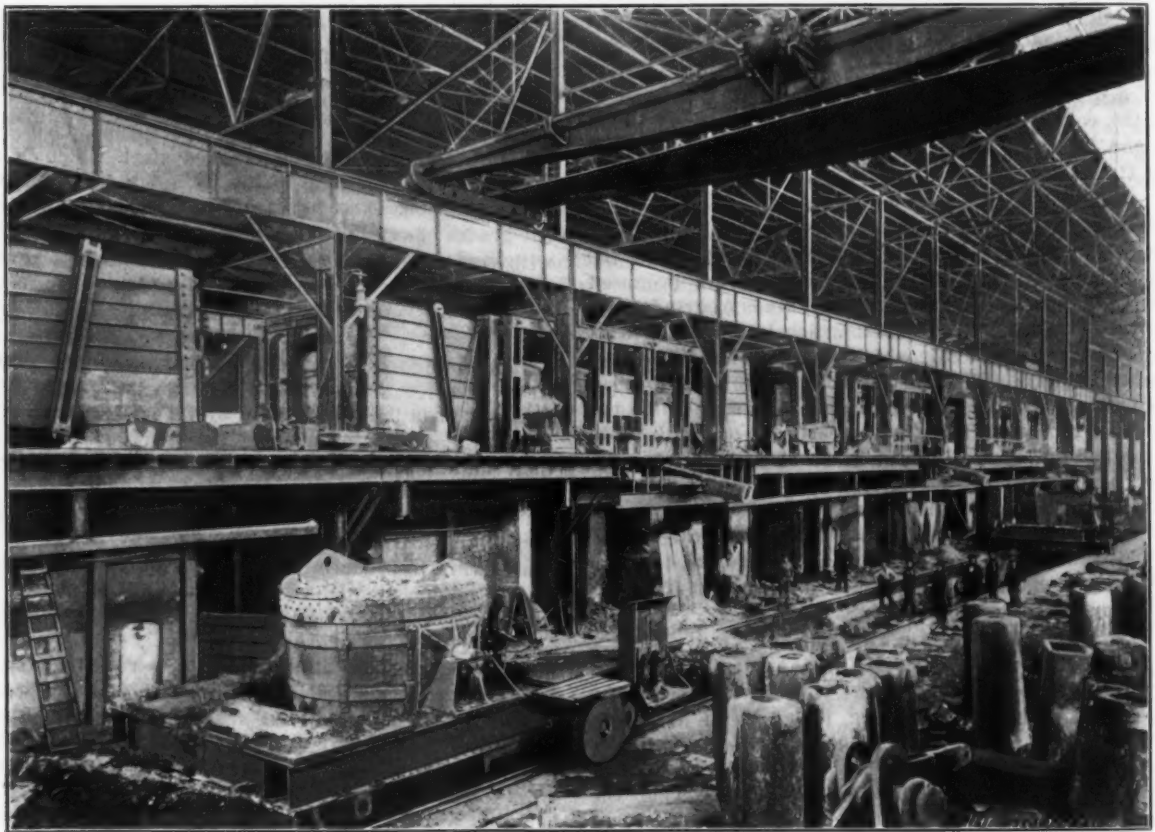


Fig. 3.—Open Hearth Casting Department.

THE INLAND STEEL COMPANY'S INDIANA HARBOR WORKS.

membered that the Inland Company recently increased their capital stock to \$2,500,000. The Indiana Harbor Works cover 50 acres of land and 50 adjoining acres have been reserved for future extensions.

Transportation System.

The property is well served by five different lines of railroad, and across the northwestern portion a shipping canal from Lake Michigan is being constructed. The track system of the company, which is shown in the accompanying diagram, Fig. 1, contains nearly 7 miles of track, commanding the various buildings and storage yards, giving excellent facilities for the handling of both the raw material and the finished product. The railroad equipment consists of two yard locomotives and the necessary amount of rolling stock. On the south and southeast the property is served by the Indiana Harbor Rail-

ter shops, oil house, scale house and warehouses and office building. All buildings are of steel and brick construction.

Open Hearth Furnace and Blooming Mill.

The open hearth furnace building and the blooming mill building are practically one, 1000 feet in length, and at the eastern end is a billet dock, 60 x 200 feet. The open hearth furnace building proper is 132 x 330 feet, the soaking pits—eight in number—being located at the eastern end or between the furnaces and the blooming mill. The open hearth and blooming mill buildings are together served by five electric traveling cranes. There are four 50-ton basic open hearth furnaces, from each of which are taken 16 to 18 heats per week. A general view of the casting house, where the molten metal is poured into ladles mounted on cars, is shown in Fig. 3. The raw

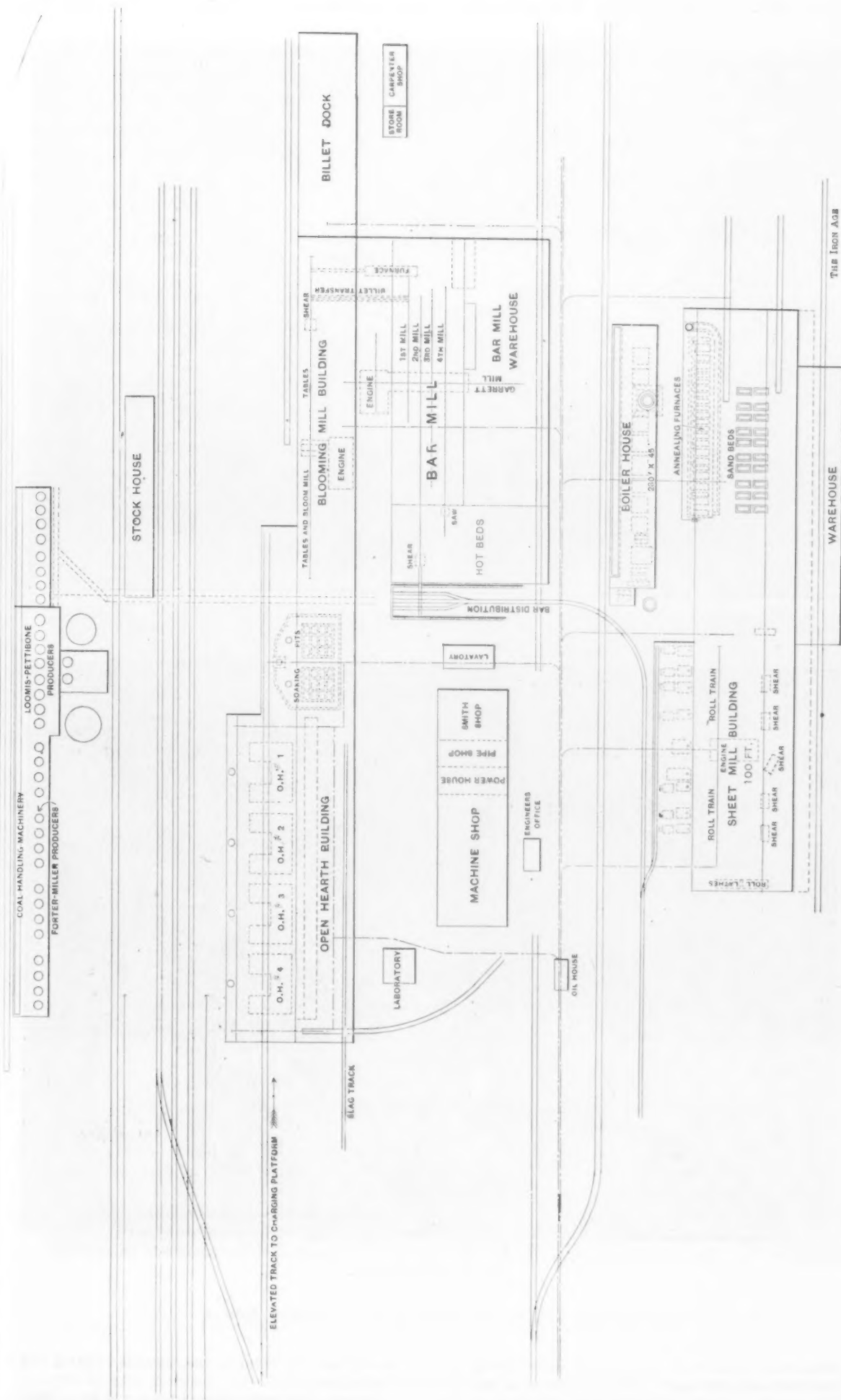


Fig. 1.—Ground Plan.
THE INLAND STEEL COMPANY'S INDIANA HARBOR WORKS.

material, pig iron and scrap, is carried by an elevated track to the charging floor of the furnaces, as shown on the ground plan. The raw material used in charging

ing the first machine of this character to be installed in a steel plant. It is shown in Fig. 4. A steel arm is inserted into the slot in the loaded metal box, which is then

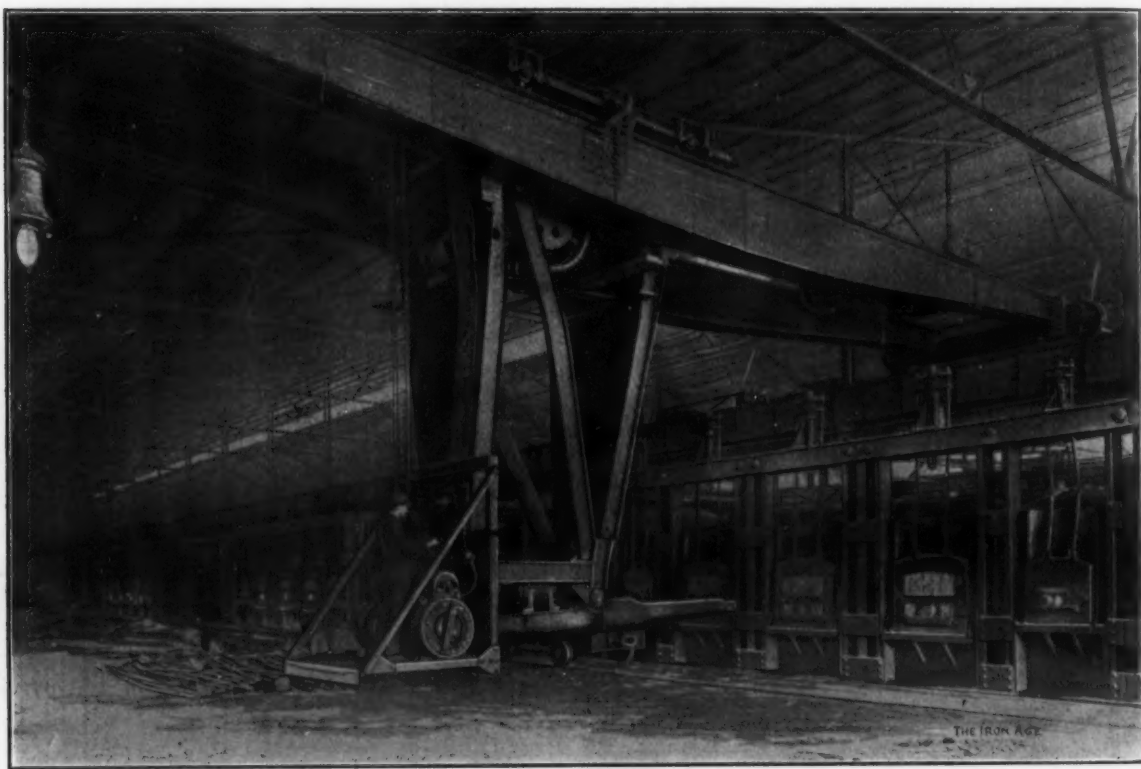


Fig. 4.—Open Hearth Charging Machine.

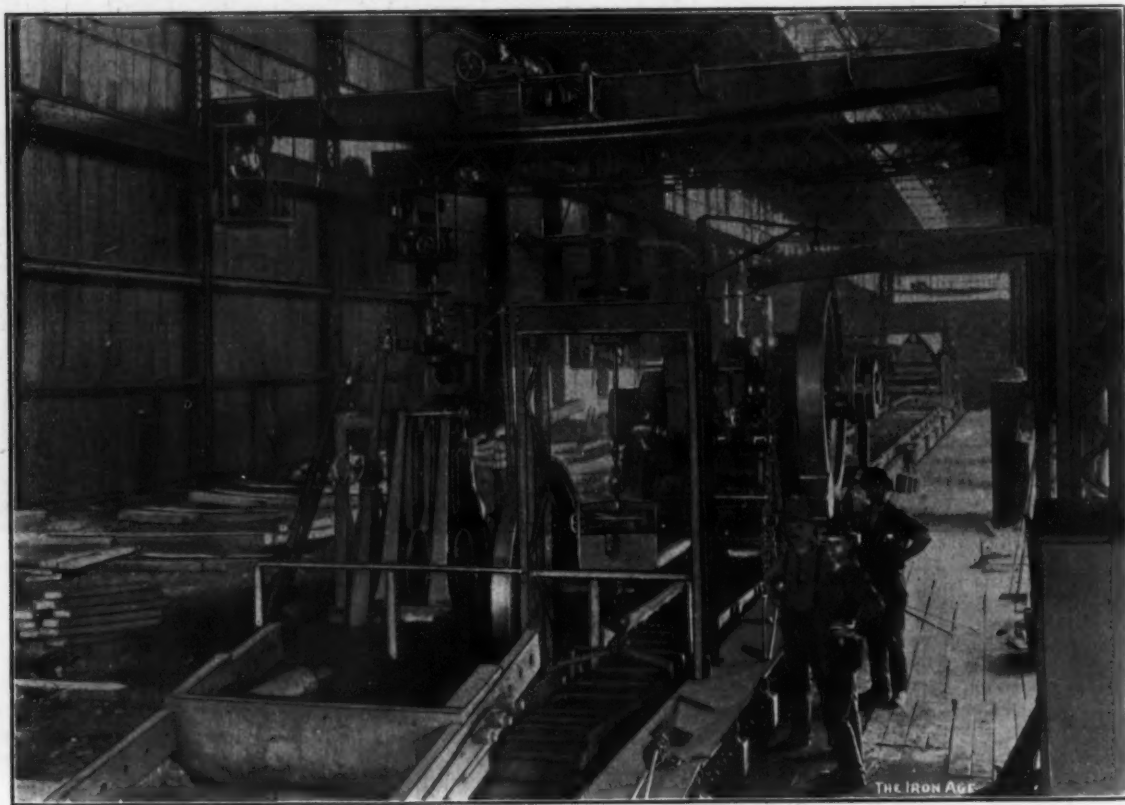


Fig. 5.—Blooming Mill.

THE INLAND STEEL COMPANY'S INDIANA HARBOR WORKS.

the furnaces is handled in metal boxes, which are delivered and mechanically discharged by a special automatic traveling machine, electrically driven, constructed by the Morgan Engineering Company of Alliance, Ohio, and designed especially for the Inland Steel Company, this be-

projected into the furnace, the contents emptied and the box withdrawn.

The blooming mill building proper is 60 x 472 feet. The blooming mill has 32-inch rolls, and is served by tables on either side. A view of this mill is shown in Fig.

5. The shears are located 122 feet from the mill, beyond which is a transfer table operated by an electric motor, and upon which billets or blooms after being sheared are

Merchant Bar Mill.

The bar mill building is 150 x 340 feet, and is located parallel to the blooming mill. It is equipped with a 24-

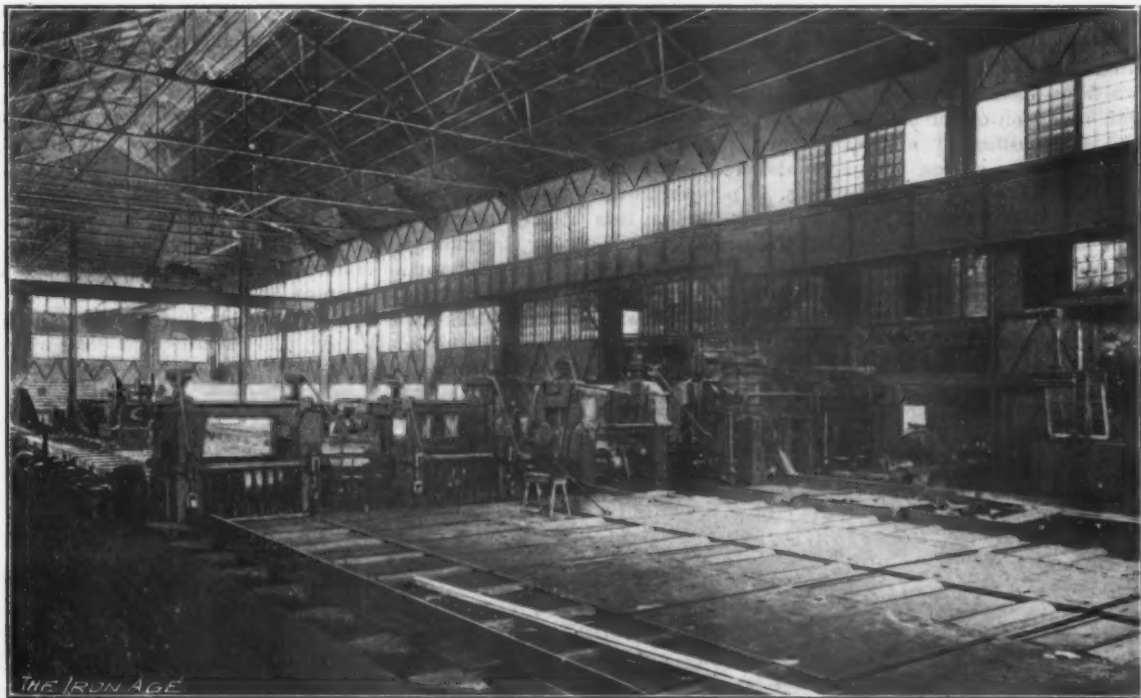


Fig. 6.—Bar Mill.



Fig. 7.—Sheet Mill.

THE INLAND STEEL COMPANY'S INDIANA HARBOR WORKS.

transferred and delivered for rolling to the bar mill. Power in the blooming mill, other than that already referred to, is furnished by an engine located in the blooming mill building opposite the blooming mill.

inch train, having four stands of rolls, driven by a pair of 36 x 48 Tod reversing engines, the engines being located in a separate building between the blooming and bar mills. A view of this mill is shown in Fig. 6. The

roll table leading from the bar mill to the hot beds is commanded by a cold saw, the hot beds being located at the extreme western end of the bar mill building, to the north of which are the shears. The bar mill warehouse, which is under the same roof, is south of the bar trains and at a lower level, commanded by one 40-ton electric traveling crane of 80-foot span. The hot beds are served by two 5-ton electric traveling cranes of 80-foot span. The roll tables on either side of the bar mill insure the economical handling of all heavy bars, flats, rounds, squares, I-beams, angles, channels and tees, it being claimed that there is a saving of fully 75 per cent. over the usual bar mill practice. It is worthy of note that this bar mill is the first 24-inch reversing finishing mill covering a variety of finished products ever erected in this country.

The shears, cold saw, straightener and iron bulldozer installed in this building are all electrically driven by in-

the novel features of the installation. There are ten pairs of 126-inch square shears driven by independent motors. There are 16 annealing pits. Fixed gas, which is piped from the gas producers, is used in heating the furnaces and annealing ovens, the point being made that much cleaner sheets are produced than where coal is used, as fuel.

Boiler House.

The boiler house, which is 45 x 280 feet, is equipped with ten batteries of boilers, stoker fired, having a capacity of from 5500 to 6000 horse-power. Eight of the boilers are Sterling and two Van Dyke. Probably the most interesting feature of this installation is the traveling charging apparatus, which is electrically driven. Coal is carried to the boiler house on cars and dumped into bins beneath the surface of the ground. The coal elevator picks the coal from the bins 12 feet below the level of the boiler house floor, and elevates and discharges its



Fig. 8.--Sheet Mill.

THE INLAND STEEL COMPANY'S INDIANA HARBOR WORKS.

dependent motors. The bars are distributed by means of a 3-foot gauge industrial track, located under cover at the extreme western end of the bar mill.

Sheet Mill.

The sheet mill building, which is 100 x 575 feet, is the most southerly structure of the plant, and is parallel with the other buildings, the boiler house being located between the sheet and bar mills. The sheet mill warehouse is a lean-to, 45 x 275 feet, located opposite the sand beds, and is provided with a railroad track which passes through the building from end to end. The relative position of the annealing ovens, sand bed, roll train, shears and other equipment is well shown in the ground plan. The building is served by one 25-ton crane with a 5-ton auxiliary, and the warehouse by a 5-ton crane, all electrically driven. There are eight 36-inch finishing mills, driven by a pair of 36 x 60 Corliss engines. The roll train and sheet mill are shown in Fig. 7, and an excellent view is given of the patent elevating machine and turning and dressing rolls in Fig. 8. This building is also equipped with a steam pickling machine, which is one of

contents into the hoppers supplying the stokers. In the boiler house are also located hydraulic distributing pumps, water purifier and feed water heaters. Fig. 9 shows the coal charging elevator in operation. The men shown in this illustration are engaged in raking out the furnaces. Under ordinary conditions there is scarcely a man in sight. This is probably one of the most economical installations known to modern practice.

It should be noted that there are only two places throughout the works where coal is handled, about one-half the total consumption being at the gas producers and the other half at the boilers. The total consumption is from 450 to 500 tons daily.

Power House.

The power house, which is under the same roof as the machine, pipe and smith shops, is 26 x 70 feet, in which are located the engines, generators and dynamos. But, as has already been noted, isolated engines have been installed in the blooming mill and between the blooming and bar mills. Power is furnished by two high speed 250 horse-power Ames engines operating one 500-kw. gen-

erator, being a direct current of 250 volts. In generating light one 150 horse-power engine, two dynamos of 200 kw. and one dynamo of 100 kw. are employed. A direct current of 110 volts is used.

Gas Producers.

The gas producing plant is located at the extreme northern side of the property, coal being supplied to the producers by automatic machinery. There are 32 producers, in three separate installations, 16 being located in a building 35 x 279 feet, eight in a building 45 x 126 feet and eight in a building 35 x 120 feet. The fans are driven by an engine located in a building 42 x 48 feet, upon either side of which are the gas reservoirs, where the gas is stored under pressure and is piped to different parts of the plant.

Minor Buildings.

The machine shop, power house, pipe shop and blacksmith shop are together in one steel and brick building, 70 x 232 feet, heated by exhaust steam. All of these divisions are equipped with modern machinery. The dimensions of the other buildings are: Office building, 40 feet square; stock house, 28 x 200 feet; scale house, 18 feet square; carpenter shop, 25 x 90 feet; oil house, 15 x



Fig. 9.—Boiler House.

THE INLAND STEEL COMPANY'S INDIANA HARBOR WORKS.

30 feet. The laboratory, which is 32 x 34 feet, is well equipped, employment being given to four chemists, two being on duty throughout the day and two at night.

Water Supply.

An artesian well 285 feet deep has been sunk, which supplies water for the plant for all needs other than steam purposes. It is stated that the analysis of this water is similar to that of the famous White Sulphur Springs of Virginia.

Operation of the Plant.

The first heat of steel at the Indiana Harbor Works was taken on July 22, 1902, and by the close of the year all the other departments were in operation, but it was not until early in 1903 that the plant was working to the complete satisfaction of the management, there being the usual delays and necessary changes always encountered in starting a new steel plant. The company are now giving employment to 850 men at Indiana Harbor and 300 at Chicago Heights. The latter plant was first operated by this company in June, 1894.

Chicago Heights Plant.

At Chicago Heights special attention is given to the production of steel for agricultural implements and the bedstead trade, the capacity of the works being 150 tons daily. This plant is said to be the only works making steel plow beams, and it is also the largest producer of steel harrow teeth. A new industry which is growing rapidly is the manufacture of steel cross arm braces for telegraph and telephone poles, both plain and galvanized. The company have recently installed a new plant for galvanizing by electricity.

The Project to Import Tin Ore.

From an interesting letter to the *Straits Times* by R. F. Pearce, manager of the International Tin Company, Singapore, regarding the action of the Government of the Federated Malay States in placing a prohibitive export duty on tin ore, the following extract is taken:

"I wish to state that the International Tin Company have never had any connection whatever with the United States Steel Corporation, the Standard Oil Company or the American Tin Plate Company, and have never been, nor are now, 'backed up' by any of the above mentioned companies or any other organization or company whatever. Neither have the International Tin Company ever had any idea of attempting to control the tin situation in the Malay Peninsula, but merely to compete with other local buyers of tin ores, with the expectation of obtaining a fair share of the business.

"There is no truth whatever in the report that our proposed scheme for smelting the tin ores which we expected to purchase in the Malay Peninsula, in the smelter which we have built for that purpose in Bayonne, N. J., was due to the fact that we expected the United States to place an import duty on metallic tin, and allow tin ores to enter free of duty.

"I do not know the sources of information which prompted the writers of the various articles and editorials to assume so confidently that the United States Government expected to place an import duty on metallic tin, allowing tin ores to enter free. They must be much closer in touch with the future policy of the United States Government than any American citizen that I know of.

"The building of our smelter in Bayonne, and our scheme for smelting our tin ores there, was entirely due to the fact that we believed that it was a step in the right direction to bring about economies in the general scheme of producing tin from tin ores.

"Our intentions were to develop as much as possible all methods for the preliminary treatment of tin ores, and to carry on these operations in the Federated Malay States or Straits Settlements, and, after having produced tin concentrates of as high a grade as possible, we figured that it would be much more economical and practical to ship them to our smelter in the United States for the actual smelting and refining."

A meeting of the Conference Committee of the Amalgamated Association with the officials of the Youngstown Iron, Sheet & Tube Company will be held at Youngstown, Ohio, this week for the purpose of deciding on the skelp mill scale. The company stands in a unique position regarding the Amalgamated Association. In July the scale for part of the mill was signed. The skelp mill scale was held in abeyance until certain machines could be installed and placed in working order. This would materially change the scale in that department.

Reports from Sydney, N. S., state that the Dominion Iron & Steel Company have begun work on the new rod mill, to take advantage of the handsome Federal Government bounties, and it will be pushed forward actively until completed. Work on the new steel rail and plate and structural steel works of the company at Sydney will be begun at once and also pushed forward vigorously in order to take early advantage of the bounties on rails, plates and structural steel.

Notes from Mexico.

The Iron and Steel Industry.

DURANGO, August 25, 1903.—The starting of the extensive iron and steel plant in Monterey, the erection of two new blast furnaces of large capacity at Tepeyahualco, in the State of Puebla, the taking over of the Tula Iron Works, in Julisco, by a strong New Jersey corporation, and other signs of growth, seem to justify the belief that the iron and steel industry in Mexico has entered upon the second stage of its development. There could be no better evidence of the industrial progress of the country than is afforded by the expansion of this interest. Happening as it does at a time when the financial problem, which affects all branches of industry, may be said to be at an acute point—for no one can foreshadow the course of legislation following the present consideration of the monetary question by the Government—this activity in projecting new undertakings in a field so important may justly be regarded as a cheerful augury.

The abundance of raw materials in Mexico, necessary for the establishment of the iron and steel industry, is no doubt a powerful factor in attracting capital to invest in it. The large and extending local market for manufactured iron and steel products is a no less strong inducement. It is, unfortunately, true that the supply of coal, a very necessary element, is as yet limited, with no immediate prospect of an appreciable increase in the domestic production. This fact will greatly hamper any new works which may be started, as it now does those which are in operation. Still, several of the States have as yet been barely prospected, and the discovery of large deposits of coal of good quality is by no means outside of the range of possibility, even if those known to exist should not upon further development come up to expectations as to quality and quantity. Great forests of hard wood suitable for making excellent charcoal are here, however, and capital, combined with energy and enterprise, may do much to overcome the serious drawback indicated.

In the district of San Marcial, Sonora, there are extensive fields of anthracite. The question of ownership to this property, long in dispute, has now been settled by the Supreme Court. Almost simultaneously with the court's decision, a report came from New York to the effect that a large steel plant would be built in the State in which this coal exists, the names of John D. Rockefeller and the Colorado Fuel & Iron Company being given in connection with the proposed undertaking. This report, of course, needs confirmation, its truth or falsity being at present a matter of conjecture in Mexico. Similar rumors have gained circulation here previously. Not long ago the United States Steel Corporation were credited with the intention of erecting an extensive steel works in the State of Guerrero, where it is alleged that a large body of iron ore has been discovered. The rumor in regard to the project of the Colorado Fuel & Iron Company may be equally unfounded.

The fact remains, however, that such iron and steel plants as have been established in Mexico are doing well despite the straits to which some of them are put at times to obtain an adequate supply of fuel. The field is an inviting one notwithstanding its drawbacks. Other capitalists will doubtless soon take advantage of its possibilities and overcome by the force of their genius all obstacles which seem to obstruct the pathway to success.

United States Courts and Mexican Properties.

Two recent cases wherein courts in the United States have taken action in matters affecting Mexican interests have caused a good deal of comment here. One is that of the New Jersey court which placed an embargo upon the two new Mexican cruisers in the Elizabethport, N. J., shipyards, now about completed, on account of a claim for materials used in the construction of the vessels. The people of Mexico have taken great interest in these warships, and have looked forward to their delivery with pleasurable anticipation. The fear that legal complications might delay their completion and entail expense to

the Government, caused not a little anxiety upon the publication of the news of the embargo. It is not too much to say that a certain feeling of resentment was mingled with this anxiety, for the reason that the stipulated payments having been made according to contract, it was felt that the two boats belonged to the Mexican Government, and that therefore they should not be held for debts contracted by the builder. This feeling has been set at rest by the *Diario Oficial*, which, referring to the incident, remarks: "It is to be hoped that the authority that ordered the embargo will modify its proceeding and that Mexico will recover her boats, since upon no ground can these boats be considered other than the exclusive property of our Government. But whatever the case may be care was taken to exact from the contractor enough securities to guarantee his contract, and in that way the national interests are assured."

The second case is that of the appointment, also by a New Jersey court, of receivers for the Coahuila & Pacific Railway Company, built under a concession from the Mexican Government. The interference of United States courts of law with properties purely Mexican, and situated in the republic, raises issues too complicated to be discussed here. But it may be said, without intent to be disrespectful to United States courts, that foreign investors in Mexico and aliens holding concessions from the Mexican Government who get into difficulties which call for legal adjustment, will do well to bear the fact clearly in mind that the proper, and the surest way to effect a settlement of the matters in dispute is through the medium of the tribunals of justice in the country in which they are carrying on their operations. The idea that a foreign court possesses the power to transfer titles and change the ownership of properties in cases where Mexican courts of justice alone have jurisdiction, has its parallel in absurdity in that held by a certain promoter who affected to believe that his concession conferred upon him the right to alter the map of the republic by changing the names of its cities. He learned his error. Mexican names serve still well enough for a people who have long been accustomed to select their own heroes.

Industrial Notes

The production of sugar is increasing rapidly in Mexico, consequently the demand for sugar mill equipments is active. A great deal of the machinery used upon the *haciendas* is of United States manufacture and is considered by experts to be superior to all other. Louisiana supplies a large proportion of this class of machinery, with New Orleans as the shipping point. In one recent instance an entire sugar making plant was transferred from a Louisiana plantation to a Mexican *hacienda*. Among projected enterprises of this kind requiring machinery is a refinery in the Panuco River district, for which the Eastwick Engineering Company of New York have authority to make contract, and another at Fuentes, Sinaloa, which is being constructed by the Sinaloa Agricultural & Mfg. Company. It may be of interest to state that the leading sugar producers of the republic have just entered into an agreement to maintain the price of the home product by manufacturing for export an agreed quantity of their output.

The litigation which has long been in progress between Charles H. Johnson and Charles P. Eagan for the possession of certain anthracite coal lands at San Marcial, Sonora, has come to an end through the decision of the Supreme Court of Mexico, which has ruled in favor of the litigant first named.

Orders have been placed in Cleveland, Ohio, for mining machinery for the Velardeña mines belonging to the Mexican Mining & Development Company.

The *Diario Oficial* publishes the conditions of two important concessions granted for the utilization of the waterways for irrigation purposes, enterprises which will involve the purchase abroad of considerable equipment. One of these concessions is to Antonio Rodriguez for using 6000 liters per second from the River Atoyac, in Puebla. The construction of the works must be begun within two years and completed within seven years. The machinery and apparatus are to be admitted free of customs duty. The concessionaire is required to pay the sum of \$250 monthly to the Government for inspec-

tion expenses, and guarantees the fulfilment of his obligations by depositing \$5000 in bonds in the National Bank. A company has been formed under the name of the Compañía Irrigadora de Tehuacan, with \$300,000 capital, to carry out the undertaking. The company's plans include the irrigation of a large area of agricultural lands, comprising 23 towns and villages with a combined population of 60,000.

The second concession is granted to Dionisio Izquierdo for the hydraulic works necessary to utilize 600 liters of water per second from the Tequimilpa river, in the State of Mexico, for irrigation purposes. The conditions of the concession are similar to the foregoing, excepting that the concessionaire contributes only \$60 monthly for inspection, and deposits \$1000 as security in the National Bank.

A modern equipped factory for the manufacture of nails has been established in Guadalajara, Jalisco. The proprietors are Behn & Paulsen. The plant was started last week.

A company, with \$500,000 gold capital, have been formed under the name of the Weber Gas Producer & Power Company of Mexico, for the manufacture of engines, to be operated by gas made from charcoal. The president is George J. Weber; vice-president, Ernest Otto; secretary and treasurer, R. G. Weber.

The Department of Fomento of the Government has determined to establish a permanent commercial museum, in which will be collected, classified and exhibited, samples of all the raw materials produced in the republic, mineral, vegetable and animal. The institution will supply full information as to the sources of such raw material, rates of freight from the places of production to any point in Mexico or abroad, and otherwise fulfil the function of a bureau of general information regarding the country's products, with the object of facilitating the nation's industrial development.

The first shipment of steel beams for structural purposes produced at the Monterey Steel Works is expected to reach the City of Mexico shortly. It is consigned to Valentin Elcoro.

The Governor of the State of Puebla, who recently visited the capital, referring to the development going on there, said: "An iron manufacturing plant is being erected at Tepeyahualco, near San Juan de los Llanos, which will rank second only to that of Monterey in importance. The plant will cost \$400,000. The iron ore will be supplied by mines which lie in the nearby *cordilleras* and extend from Tepeyahualco to the boundary of the State of Vera Cruz."

An application has been made to the State Government of Puebla for permission to establish still another Bessemer steel plant in the State. Atlixco, a station upon the Interoceanic Railway, some 30 miles from Puebla, the capital, is the proposed site.

The Monterey Steel Works are said to have orders on hand for 10,000 tons of steel rails. The rail mill has not started yet.

All the shares have been sold of the company formed with \$100,000 capital, to manufacture incandescent electric lamps under the patent owned by A. Chaillet, the concessionaire. A factory will be built at once, and the work of manufacturing the lamps entered upon as early as possible. At the first meeting of the company the following Board of Directors was elected: Carlos Casasus, A. C. Smith, M. de la Arena, Ignacio Solares and José Avila.

The construction of hydraulic power plants in Mexico is a line of enterprise which is now being actively pushed. Among other projects of this class is one for the electric lighting of various towns in the State of Vera Cruz, for which Andres Lefevre petitions for a concession. The proposed plant is to be constructed upon the river Tulancingo, in the State named.

Allende and Zaragoza, Coahuila, are to be connected by an electric railway, the system to be extended later to C. P. Diaz, making in all 60 miles of electric traction.

Dingey & Woods, who commenced business about two years ago as importers of mining and other machinery in the capital, have dissolved partnership. Mr. Woods retiring and being succeeded by W. W. Graham, a well-

known mining and business man, under the style of Dingey, Graham & Co.

The Ferrocarril de Sonora, running from Guaymas to Nogales, have recently placed an order in the United States for 40 box cars.

The Tlalpa Mining Company of Tlalpa, Jalisco, are in the market for mining machinery.

Well machinery and supplies are in demand in Yucatan. Several shipments have been made to the State by the Pierce Well Engineering & Supply Company of New York City.

Fogarty & Dickinson of San Luis Potosi have contracted with the J. H. Montgomery Machine Company of Denver, Col., for hoisting machinery and other mining equipment for a Chihuahua mining company.

The following, among other orders, have been placed for rolling stock by the National Railway Company of Mexico: Five new passenger engines and 15 consolidated freight engines, with the Baldwin Locomotive Works. A number of new passenger coaches have also been ordered by the same company.

J. J. D.

Norcross Bros. Company Reorganized.

The creditors of the Norcross Bros. Company of Worcester, Mass., have acceded to the plan of reorganization proposed by the committee of the creditors and the continuance of the old business is now assured. Judge Brown of the United States District Court for the District of Massachusetts, at a hearing in Boston on August 27, granted the petition of the receivers to be relieved of the assets of the company, which virtually ends the receivership. The court granted permission to carry out the plan of reorganization as submitted to the creditors and agreed to by them, without an exception.

There will be two corporations, one the Norcross Construction Company, or some similar name, which will carry on the contracting business, under the management of O. W. Norcross; the other, Norcross Bros., Incorporated, which will be a holding company, owning all the stock of the Construction Company, and controlled by trustees elected by the bondholders. Norcross Bros., Incorporated, will issue bonds to the amount of the indebtedness of Norcross Bros. Company and O. W. Norcross, and the earnings of the stock of the Construction Company, held by Norcross Bros., Incorporated, will be devoted toward paying the interest on the bonds and in retiring them from time to time, as the surplus shall warrant it. All holders of the paper of the Norcross Bros. Company and of O. W. Norcross personally will receive bonds in full for the amount of their claims. Other creditors will receive either bonds to the amount of their claims in full, or else 25 per cent. cash and the balance in bonds.

Judge Brown also gave permission for the carrying out of the \$1,700,000 contract with Harvard University for the new medical school buildings, a bond of \$200,000 being required by the university to insure the proper carrying out of the contract. Not a word of opposition to the plan developed at the hearing. Judge Brown complimented Receivers Smith and Luey on the remarkable facility with which the receivership had been concluded.

New Blaisdell Lathe.—P. Blaisdell & Co., Worcester, Mass., are putting on the market an engine lathe containing a new rapid change feed device by which any feed can be obtained, ranging from feeds as coarse as practical up to as fine as 243 to the inch. With this advice any one of five different feeds can be obtained in an instant by simply moving a lever at the front of the tool at the head. A different series of five changes each can be obtained by changing a gear either on the stud or screw, thus making it possible to procure an indefinite number of feeds. If a coarse feed be desired a range from 7 to 21 to an inch may be obtained, or if a very fine feed is wanted a range of from 81 to 243 to an inch is obtained. It is a geared rod feed. The screw remains idle except when wanted for screw cutting, a clutch placing it in operation. This Blaisdell lathe is a heavily constructed tool of the best quality of material and workmanship throughout.

A German Reversing Valve for Regenerative Furnaces.

Reversing valves for regenerative furnaces may be divided into two classes: 1, Valves which, combining with a quick reverse comparatively small loss of gas, have the disadvantage of soon warping and thereby losing their tightness. 2, Valves which take longer to operate and thereby cause considerable loss of gas unless such loss is guarded against by a special additional valve for closing the gas flue during the reverse. In addition to the extra initial expense valves of the latter class have a further disadvantage—namely, loss of time and consequent cooling of the furnace by cold air drawn through the doors. Although shutting the gas flue during the reversing

k and *i* owing to the distance to be traversed. The rotating cylinder *b* has considerable play and is made tight after each reverse by the deposited tar and soot, thus utilizing what in other valves is often a source of annoyance.

During reversing it is impossible for gas to pass direct into the stack flue. The latter and the gas flue are shut off simultaneously by the first half turn, at which period gas cannot pass to the stack nor heat from the regenerators. Loss of gas in any manner is therefore prevented. Furthermore, combustion of gas in the valve cannot take place, so that warping of the valve chamber or of the revolving cylinder is not to be feared, and the proper operation of the valve is not interfered with. Cracking or warping of the valve chamber is also hin-

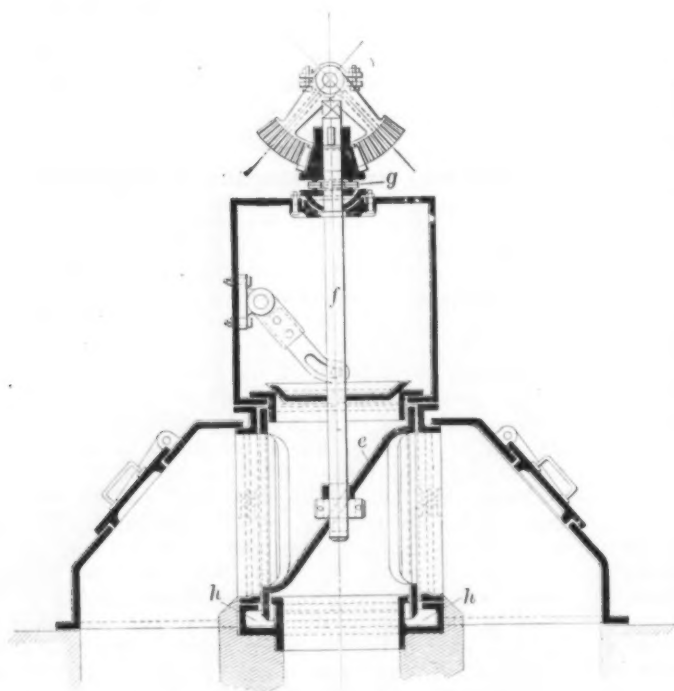


Fig. 1.

Fig. 2.

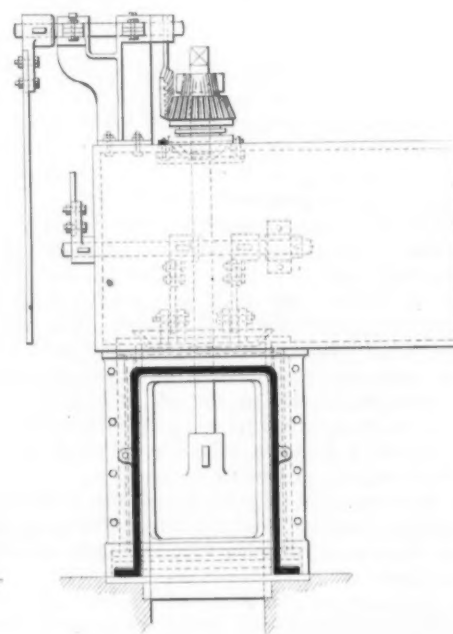
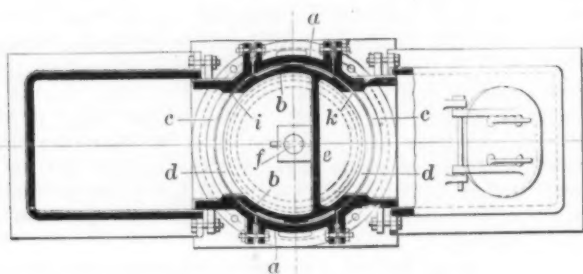
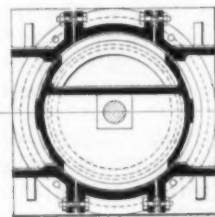


Fig. 3.

Fig. 4.



A GERMAN REVERSING VALVE FOR REGENERATIVE FURNACES.

period leads to considerable saving of coal the valve cannot be permanently prevented from warping owing to the action of gas which, having already passed the valve, is drawn back through the same when it is thrown over.

A newly patented construction called the Fischer valve claims to have obviated the above disadvantages. Its simple construction, described in a recent number of *Stahl und Eisen*, is shown in the accompanying figures 1 to 4.

The valve consists of two concentric cylinders, *a* and *b*, open at the ends and provided with the openings *c* and *d* opposite to one another. The interior cylinder *b* is divided by a slanting wall, *e*, into two parts, and is arranged for turning by means of the spindle *f*, which motion is facilitated by the ball bearing *g*. The circular space *h* at the bottom is filled with sand and permits a gas tight separation of the two flues, all the more perfectly since the cylindrical construction is unfavorable to loss of gas between the entering and leaving points

dered by reason of the even thickness of the walls and of the cylindrical cross section, especially if the casting is made of Bessemer iron, as should be the case with all articles which are exposed to great extremes of temperature.

In addition to its durability the Fischer valve is characterized by the small amount of room taken up, which facilitates its being used to replace valves of older construction. Other good points are its accessibility, its simple arrangement, its easy operation and the absence of all costs of maintenance in consequence of arrangement of closing with sand. The use of this latter doubtless causes a certain amount of friction in reversing, but the aforementioned ball bearing *g* permits of the operation being carried out without any considerable power being necessary. By using a water seal between the two cylinders this friction is done away with altogether, and the reverse takes place without any effort whatever. The use of a water joint has no disadvantages, since it is

impossible for steam to get into the furnace or for the cold water to cause precipitation from the gas, with which it does not come in contact.

This valve is in use in some of the largest works in Rhineland and Westphalia, among others at the Gutehoffnungshuette in Oberhausen, and has proved very satisfactory. A valve 24 inches in diameter saved in 24 hours 320 cwt. of coal, a proof of the value of the arrangement, which, in less than half a year, paid for itself in coal saved. The figures give also a striking warning of the enormous loss which can be caused by a defective valve system.

Talks With Lawyers on the Labor Question.—II.

A contract relation between the employer and his men, with a definite time to run, takes away the legal "right to strike." A contract will not prevent men from quitting, but it affords the employer an important legal advantage in protecting himself against picketing and other features incident to a strike.

The legal right to strike rests on the principle that a man working from day to day, at daily wages, has a right to quit at any time. If a man has entered into a contract to work for a specified time he has voluntarily surrendered the thing which gives him a right to go out on a strike. The courts look with extreme suspicion upon any breach of contract, so much so that it is unlawful for one man to influence another to break his contract. Influence, persuasive or otherwise, exerted by A. upon B. to have B. break a contract with C. is unlawful, and, the proper showing being made, C. may appeal to a court of equity for an injunction to restrain A. from interfering. A strike that is lawful under ordinary conditions of employment becomes unlawful and is a conspiracy when its object is to induce men under contract of employment to break their contract. Some States have statutes which make such a conspiracy criminal, but without statutory declaration it is at least a "civil" conspiracy.

Employers do not want any trick of the law by which they might engage in wholesale criminal prosecutions. All that they want is to enjoy their constitutional rights, with protection by the courts, as a last resort, against unjust aggressions on the part of others. It is possible that a very important means of defense may be found by establishing a contract relation with their men. The courts allow picketing and other interference with men who want to work, not so much as a right but as an indulgence to organized labor. This indulgence should only be allowed by the courts or the police authorities when a strike is otherwise lawful. If a strike begins with a wholesale breach of contract it is not a lawful strike, such as the courts have defined and allowed, but is clearly an unlawful act. Picketing in a campaign thus undertaken, is so clearly unlawful that no court should allow it, no matter how peaceably it may be conducted. Nor should any other form of interference with the employer or with the men who want to work be allowed.

The courts have the undoubted right to interfere and prevent men, working under a fair contract, from conspiring or confederating together to commit a breach of contract. In one case a court has issued an injunction against labor organizers who sought to enlist as members apprentices who had expressly agreed in their apprenticeship indentures that they would not join any union. This feature of the question, however, is one that need not be considered seriously. The employer does not need injunctions to compel men to work, or to prevent them from joining unions. Most American workmen are law abiding citizens, and when they know that it is unlawful for them to commit a breach of contract their sense of honor is a better court for the employer to appeal to than courts of law and equity.

A contract relation may be created in two ways: First, by a contract or agreement with a union or with the employees as a body; and second, by individual contracts between the employer and the employees. Agreements or contracts with unions have in many cases proved very satisfactory, as, for example, in the printing trades, which are singularly free from strikes and difficulties. The printers, as a rule, respect their contracts, and their

conservative policy has given them more complete control of their trade than the most aggressive unions in other lines have been able to obtain by lawless tactics. They are undoubtedly better paid than any other class of men in America for work of a similar character, and the tramp printer of a generation ago has been superseded by a steady and reasonable class of men.

Many large employers have tried individual yearly contracts with their men. In some cases the results have been satisfactory, but in other cases a great deal of trouble has grown out of this system. It appears that most of the trouble has come out of one-sided contracts, where in the employer has sought to gain too much and incorporated oppressive conditions in the contract that were not necessary and tended to create dissatisfaction among the men. Such contracts should be simple and easily understood, and as fair to the men as to the employer. A harsh, unjust foreman or employer makes more converts to socialism in a year than the loudest-mouthed agitator, and a harsh, unjust contract would naturally do more harm than good.

Individual contracts have many advantages over contracts with unions. They may give the man the right to quit at any time, whenever he can obtain a better position elsewhere, and, reciprocally, they may give the employer the right to discharge for any cause that may seem to him sufficient, and the right to shut down at any time on account of inability to obtain materials or orders, or in case of any event that makes it impossible to continue in operation. The employer need incur no hardships in such contracts, and the man who has a family to support is just as much interested as the employer in the continuous operation of the shop.

In a factory where a majority of the men work under yearly or season contracts it could be made impossible for agitators to bring on a strike. When a contract expires the factory can shut down and start up again under a new contract for the next year or season, taking such men as are willing to accept the terms offered. So long as the employer is fair and lives up to the contract there would be no opening for agitators to break in and make trouble, and if they tried to interfere with a man working under a contract, or tried to prevent a man from seeking employment where no legal strike existed, the police authorities ought to take care of them. Men who take a conservative view of labor problems believe that a fair yearly contract system would bring the reasonable employer and the sober, industrious majority of workmen into a strong alliance for defense against the rising tide of socialism and lawlessness.

A Modern Office Building in Mexico.

A. R. Whitney, Jr., & Co. of New York City have the general contract for the erection of the first large modern office building in the City of Mexico. It is to be completed in the spring of 1905, under the direction of De Lemos & Cordes, architects, for the Mutual Life Insurance Company of New York.

The building will have five stories and a basement, fronts on three streets and covers about 11,500 square feet of area. The site of the building is one of the finest in the capital, the northerly part of the street block being occupied by the new post office building, and the opera house will be erected in the immediate vicinity. Large hotels, office blocks and stores surround the new building. It will contain two electric elevators, plumbing, drainage, electric lighting and all fittings corresponding to a first-class office building as erected in New York. It will be constructed strictly fireproof and the foundation will be of steel and concrete, of the same description as originally designed by De Lemos & Cordes for the Boker Building in the Mexico City. The hallways will be trimmed with Italian marble and bronze, the floors will be tiled and the stairways will be of iron and marble of Renaissance design.

The front will be of Mexican stone in light color and in Renaissance style, drawn in severe and monumental character. The main front on Avenida del Cinco de Mayo is 143 feet long. The cost of the building will be over \$1,080,000, Mexican, not including the cost of the building site.

The Iron Age

New York, Thursday, September 3, 1903.

DAVID WILLIAMS COMPANY,	-	-	-	-	-	-	-	PUBLISHERS.
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RICHARD R. WILLIAMS,	-	-	-	-	-	-	-	HARDWARE EDITOR.
JOHN S. KING,	-	-	-	-	-	-	-	BUSINESS MANAGER.

The Apotheosis of Mud.

Under a fanciful and somewhat misleading title, Edward Atkinson of Boston, as director of the insurance experiment station, which is doing extremely good work in many lines of investigation, has written a report on "Mud Fuel, Coke, Gas and the Secondary Products of Gas Derived from Mud," which is more likely to find interested and appreciative readers than if less playfully entitled. In the field which chiefly engages him, Mr. Atkinson is perhaps too much a man of letters to be in the highest degree successful as a scientific investigator. He loves an amiable contention, and discovers the "news value" of a fact almost before it is evolved from the nebula of hypothesis, which leads him to the expression of very positive convictions on many subjects which it does not discredit his intelligence to say he does not fully understand, since nobody does. For many reasons it is to be regretted that he is not furnished with a ground work of accurate technical knowledge. In many respects his mental make-up is like that of Count Rumford. He chiefly values truth for what may be done with it for the immediate benefit of humanity; but, unlike Rumford, he is not an original investigator. His facts are largely gathered by experts in comparatively narrow lines working under his direction—his own function being to arrange, classify, weigh and measure such facts and bring his lively imagination to bear in finding immediate and practical uses for them. This function, which is more nearly journalistic than anything else, is performed by Mr. Atkinson with great skill, and has even greater value to the world than resides in the mere accumulation of undigested and unemployed observations of natural phenomena. In the School of Insurance Engineering, which he founded and conducts, we have a work of permanent value to the world of which any man might well be proud.

In what we have designated as his apotheosis of mud—tempted thereto by the exuberance of his own title—we have the results of an important, practical and really valuable inquiry into the fuel value—not of mud exactly, but of peat, which may be called mud only by a somewhat violent stretch of the imagination. It is a mass of partially decayed vegetable matter, largely fixed carbon, but containing some volatile constituents of calorific value. Whether it is or ever was mud depends of course upon what mud is understood to mean. The root of the word seems to be in doubt; but no use of it with which we are familiar warrants its application to the interlaced fibers of roots, grasses, weeds and leaf mold, which make up the body of the moss and peat bogs of this and other countries. However, this is unimportant. One may call it mud if one likes, but a qualifying adjective would be useful to distinguish it from the argillaceous, aluminous, calcareous, sulphurous and other muds of the geological classification, the fuel value of which is a minus quantity. Perhaps carbohydrate mud would answer.

The investigations of Mr. Atkinson were the outgrowth of a very practical emergency, the anthracite strike of 1902, which in many parts of this country, and especially in New England, caused a fuel famine. It be-

gan in a very simple and natural way. When the coal strike was in full swing and a substitute for coal was earnestly desired as an industrial fuel and for the domestic requirements of the poor, he went to his country place at Buzzard's Bay. Walking in the woodland he noticed that a vigorous growth of ferns had long been decaying on top of the glacial drift, and had accumulated about 3 feet of black "humus." He dug some of this and took it home to be dried in an iron pan by the kitchen fire. When dry it burned very well. There was nothing surprising in this, but it suggested further investigation. The matter was turned over to Professor Norton of the Insurance Engineering Experiment Station, and the results are embodied in the brochure which we have denominated the apotheosis of mud. It is interesting that the very first result of the experiments thus initiated was the acquisition near Boston of a suitable area of peat bog, from which it is expected to derive all the heat required for the effective testing of refractory and fire resistant materials available for use in constructions approved as insurance risks by the Massachusetts mutual companies.

Professor Norton's tests were conducted along the usual lines of practical demonstration. The material when taken from the bog weighed from 100 to 125 pounds to the cubic foot and resembled brown mud, with occasional twigs, roots and other intrusive stems of plants visible through it. After adequate air drying it shrunk in volume about 20 per cent., and in weight 40 to 45 per cent. Its toughness and density were materially increased by moderate pressure applied during the drying process. The denser samples compare with pine wood in hardness and strength to resist crushing strains. When quite dry it gives in the retort a firm, dense coke resembling that made from good coking coal. In coking there is some shrinkage in volume, but little or none in weight. Tests for calorific value show that the mud when "bone dry" yields in complete combustion from 9600 to 14,000 B. T. U. per pound. This warrants the conclusion that air dried bog material has a fuel value equal to from 65 to 90 per cent. of first class American steam coal. Indeed, it would seem to be considerably better than a good deal of the coal which serves a very useful purpose in the domestic and industrial economy of the country. From the data above summarized Professor Norton makes the following deductions:

I think we may now with perfect safety estimate the fuel possibility of our bogs and marsh. There will still remain the question of the cost of drying, handling and coking.

With 43,560 feet to the acre, and a depth, say, of 20 feet, we should have some 860,000 cubic feet of mud per acre. This will yield at a conservative estimate 40,000,000 pounds of air dried mud, which is equal in heating power to at least 25,000,000 pounds, or 12,000 tons, of good coal. If convenience in handling and diminished bulk will justify the coking process, we may still hope to obtain the equivalent of 10,000 tons of good coke from each acre of 20-foot bog. I leave the computation as to dollars and cents for the Director of the Station. There is almost, if not quite, enough gas distilled from the coke to make 1 pound of mud furnish enough gas to coke the next, so that the coking process once started will require no extra fuel.

The coke and the briquetted mud both burn with a hot fire and leave only from 6 to 12 per cent. of soft ash. Practice has shown the coke to be excellent in some metallurgical processes and that as a substitute for charcoal in working iron it is also very satisfactory.

Further light is needed on the cost of excavating, on the cost of equipment for drying, and the length and cost of the drying operation. We need also to experimentally determine the cost of a continuous coking operation. With these data and a determination of the depth of some of these bogs we can compute what their fuel value is, and determine what reliance can be placed upon them for an emergency supply of fuel.

From the point at which Professor Norton leaves the subject to the establishment of the practicability of mud as an emergency fuel and an important supplement to coal may be "a far cry," but not so far that Mr. Atkinson discovers any difficulty in bridging it. He is arrang-

ing to equip a station for further experimentation in this direction, and expects to be able before long to show that in our wet meadows, fresh and salt, we have a source of heat and power of more consequence than some of the important coal measures of the country, because their geographical distribution is extremely impartial. Indeed, they may be said to be found everywhere. These bogs are of two kinds—those built up of the sphagnum moss and the special varieties of mosses and ferns which grow together in wet places, and those built up of decayed grasses and weeds which grow with them. The former furnish what in this country is known as peat; the latter the meadow mud, which has been made the subject of investigation by the staff of the experiment station.

The availability of peat is not a new discovery; that of mud from salt meadows and bog lands, while long known to geologists, will come to many as a revelation. Here is a raw material of very little initial value and scarcely capable of monopolization. It is much more cheaply mined than coal, and much more safely, since it lies upon the surface or very near it. To drain the bogs, swamps and marshes and thus begin its conversion into a useful product involves no great difficulty. If it cannot be done by gravity it may by wind power. Air drying is a slow process, and involves some expense for shedding and handling. To expel the greater part of the water and at the same time compress the material into briquettes of convenient size and shape, by mechanical means, should be simple and economical. To make it bone dry by mechanical treatment would perhaps be impossible, but if all the water which pressure or rotation will expel is disposed of, air drying will do the rest very easily and in comparatively short time. The shape of the briquette might greatly facilitate this, and at the same time favor rapid and complete combustion. In the dry peat, or marsh mud, what have we got?

1. A fuel comparing favorably, pound for pound, with first class American bituminous coal, very little of which yields as high as 14,000 B. T. U. to the pound with complete combustion.

2. A smokeless fuel, the burning of which involves very little difficulty.

3. A material from which an excellent grade of firm and hard metallurgical coke may be made, free from sulphur and lower in ash than any coke with which we are acquainted. This should be a superior forge fuel and extremely useful in many smelting operations.

4. A free burning domestic fuel as convenient as wood and very much cheaper than any kind of coal, except in close proximity to the mines.

5. A cheap source of gas, with the usual valuable by-products now obtained in the coking of gas coals in retorts and from the destructive distillation of wood.

6. A source of peat meal, of which extensive and profitable ~~has been~~ made in Germany for many years. It has great value in absorbing and holding ammonia and saving what without it is a great waste of fertilizing material. Air drying, with alternate freezing and thawing, will reduce to meal the uncompressed bog material without other cost than cutting and stacking it.

Very likely this list might be further extended, but it is already long enough to attract attention and fix the interest of inventors and builders of machinery, as, indeed, it is already doing. It is not "moonshine" by any means. Granting that where coal is plenty and close at hand no other form of fuel can advantageously compete with it, the fact remains that there are vast areas of the United States where it is neither plenty nor cheap, and where the costs of transportation and distribution make it as costly as it is inconvenient. For such areas

the possibilities of moss and grass peat as sources of heat, power and light are almost unlimited. In calling attention to them in the way he has done and inspiring the reader with some of his own enthusiasm, Mr. Atkinson has added another to his many and distinguished public services. His work should bear fruit.

Impending Congestion of Traffic Lines.

Entering the month of September, the business community is confronted by conditions which make a congestion of traffic on nearly all transportation lines highly probable in the near future. Indeed, even the most alert railway managers are unable to see how congestion of freight can be avoided, notwithstanding the large increase in equipment which has been provided during the past year. We referred to this matter some weeks ago, and since that time developments in the business world have been such as to fully verify the deductions then made. In this instance, especially, coming events have cast their shadows before. Not only the trunk lines but the minor roads are already experiencing much difficulty in moving the tonnage now offering them for transportation. The east bound roads out of Chicago and St. Louis are feeling the strain especially, but the west bound roads are by no means exempt and wheels are whirling in the South to an unprecedented extent.

It is the opinion of both Eastern and Western traffic managers that while all carriers have increased their rolling stock since the worst congestion of traffic last winter, the increase in cars and motive power has not been in proportion to the increase in business. Few, if any, roads at the present time possess equipment adequate to their maximum needs. It will be remembered that a year ago statements of the shortage of cars were met with the reply that cars were in ample supply, it being the great deficiency in motive power that prevented quick movement of freight. This, probably, was the true cause, for a while at least, of the traffic congestion, but this year there is a decided change in this respect, as most of the roads have addressed themselves more vigorously to the obtaining of motive power than to an increased supply of cars. Now, even this greatly reinforced motive power is beginning to feel the strain that has been placed upon it during the past month or so.

In the Central West traffic managers announce that the shortage will be felt most in box and flat cars, while in the Eastern territory there is more likely to be a shortage of gondola cars. In the South, however, the deficiency will be felt in all kinds of freight carriers. The condition in the South is well reflected in the claim of a prominent railroad president that, although the lines have supplied themselves with new equipment fully ample to meet the needs of their system alone, yet because of the urgent needs of foreign roads their cars are diverted and even the *per diem* charge of 20 cents is inadequate to cause the return of their property, connecting lines being so greatly in need of cars that they willingly pay the *per diem* rate and retain the rolling stock.

Attention is called to the further fact that the impending congestion of freight is more likely to result from inadequate terminal facilities than from shortage of cars. Not a few railroads have made endeavors to improve terminals, but this is a problem not so easily dealt with as equipment. Even the Pennsylvania Railroad has given warning of impending trouble of this sort at Pittsburgh. In fact, it is already being felt to a considerable degree, especially in the coke regions, where it now takes from six to eight weeks, in some instances, to make deliveries of coke on contract in the Chicago territory. The rail-

roads centering at Kansas City, it would seem, have been forced to provide new terminal facilities and a rearrangement of yards, the Frisco, the Santa Fé, the Rock Island, the Milwaukee, the Burlington and the Missouri Pacific being active in construction work of this character. At other points in the West and Southwest there is great activity in railway construction, and the urgency of this work has created not only an active but a pressing demand for second-hand small engines, cars and steam shovels; in fact, for all contractors' equipment. So great has been the pressure for steam shovels that those which under ordinary circumstances would find their way into the scrap heap are now selling at large premiums over the original cost.

Not a few shippers in the Central West at least have been forehanded enough to secure a large stock of fuel, so that probably there will be less delay and actual suffering on this account. But there are many consumers who have failed to profit from past experience.

The immense volume of traffic, present and prospective, and the great diversification of shipments are evidence, at least, of wonderful industrial activity and growth in the general merchandise trade in all territory, but tributary to Chicago and St. Louis especially. This vitality, and even virility, is an answer to the pessimistic views which have recently been expressed by prominent financiers, influenced of course by the shrinkage in security values. The enforced liquidation in securities, however, was perhaps a blessing in disguise, calling for the exercise of more conservatism in business enterprises and a more wholesome financial policy among railroads, discounting in many respects the inevitable reaction from the high pressure speed of business for a year or more. The result, doubtless, will be a more healthful if a somewhat decreased business during the coming winter, indicating a more stable and a prolonged period of prosperity.

Railroad earnings seldom, if ever, have been greater than at present. This is especially true of the gross returns; but the net earnings have been somewhat reduced because of the tremendous expenditures for betterments, which were, and are, essential to economical efficiency. Much might be said in criticism of the financial policy of transportation lines, both before and since the merging period, which in a measure reveal the undercurrents responsible for recent conditions in Wall Street. But such a recital is foreign to our present purpose, which is rather to call the attention of both shippers and consumers to the physical condition of transportation lines, and what influence these conditions have or will have upon manufacturing and general mercantile business during the remainder of the calendar year.

Present Tendencies in Some Machine Tool Demands.

Recent inquiries received by machine tool builders indicate that the limits of the demands made by users of steels for high power machines have not yet been reached. One concern asks for a lathe warranted to take a chip 1 inch deep, with a feed of $\frac{1}{8}$ inch, at a speed of 130 to 150 feet per minute. Machine tool men, appreciating the difficulty that would arise in designing a drive that would meet these requirements and also in providing a method of supporting the work under the tremendous strains that would be set up, look askance at the proposition, and each prefers to have some one else make the experiment.

An experienced builder, commenting on some recently placed orders, expresses the opinion that the demand for rapid change multi-feed engine lathes will soon reach a

limit, and tend to decrease rather than increase. In specializing work many manufacturers are striving to put it out of the power of the workman to exercise his judgment in the matter of feeds. This is illustrated in the case of one manufacturer, who placed an order for eight engine lathes of the same capacity. The specification was that only three feeds should be obtainable on a lathe; that the feed should be arranged so that it could not be changed without some trouble to the workman, and that each of the eight lathes should have its three feeds distinct from each of the other seven. The manufacturer had figured closely the maximum work that a man could get out of a lathe on his special task, and the intention was to compel the workman to maintain the feed determined for him; in other words, to take the matter of judgment out of the shop and keep it in the drafting room. He maintained that by having the feeds of each lathe distinct and independent of all the others, he would be better able to keep track of each machine's production. This would certainly be true in a plant the character of whose output would permit the employment of each of these lathes on work for which it was best suited. In this case each lathe would merely resolve itself into a special tool, designed and used for one particular job and not adapted, because of its limited range, to the economical production of any other work. Such a plan could not be introduced with advantage in a small shop having a widely varied line of parts. Nevertheless, the regulating of the speed of tools, both spindle speed and feed, is becoming a question of greater responsibility for the shop foreman each year. The desire to keep the rapid change multi-feed lathe out of the reach of the workman is apt to grow, but we do not believe it will extend except along the lines indicated above.

The Franklin Rolling Mill & Foundry Company.

The Franklin Rolling Mill & Foundry Company, at Franklin, Pa., have started up their plant in the manufacture of high grade rolled steel and malleable and gray iron castings and will make a specialty of the manufacture of tripartite steel poles. These poles are made of basic steel and are especially designed to meet particular strain conditions. This pole is adapted for electrical railways, power transmission lines, telephone and telegraph lines. The rolling mill department is used for the production of high grade rolled steel for light structural work. A U-section shape is a specialty of this department. This section is rolled from old steel rails and is high carbon, running from 30 to 40 points, which gives it strength and elasticity. This section is used in the construction of the tripartite steel pole for all overhead construction. The daily capacity of the department is about 80 tons. The malleable iron department is equipped with the latest and most improved refined air furnaces, which produce the finest high grade iron. The annealing ovens are arranged to insure perfect annealing. The gray iron department is furnished with one of the best cupolas known, and has a daily capacity of 50 tons. It is furnished with very heavy traveling cranes for handling any size castings. The steel and iron rivet department is equipped with furnaces and automatic machines for making soft rivets from Bessemer steel of structural sizes and any shaped heads. The capacity of this department is about 50 tons per day.

An Air Furnace Melting Record.—The first heat in a new improved air furnace was run by the Philadelphia Roll & Machine Company, Philadelphia, Pa., on August 24. This furnace and two other smaller ones were charged with a total of 62,000 pounds of charcoal iron, the melting schedule being as follows: No. 1, lit at 8.30; No. 2, at 8.40, and No. 3, at 8.45 a.m. Test pieces were taken at 3.30 p.m., and all three furnaces were down ready for casting at 3.55 p.m. At 4 p.m. the three furnaces were tapped, the three heats being poured and

completed at 4.25 p.m., the metal being poured in five charcoal iron sand rolls. The entire time consumed in running the heats out of the three furnaces was seven hours and 55 minutes.

The Schwartz Furnace on Malleable Cast Iron.

We have received the following report on malleable cast iron test heat, made on June 12, 1903, in a No. 3 60-inch Schwartz furnace, at the works of the Hawley Down Draft Furnace Company, Chicago, Ill. This test, which was made in the presence of representative malleable iron and steel men, was conducted by Dr. Richard Moldenke, whose analysis of mixture was used and whose report is given herewith:

NEW YORK, June 20, 1903.

THE HAWLEY DOWN DRAFT FURNACE COMPANY,
Chicago, Ill.

GENTLEMEN: I beg to hand you herewith report on the test for malleable casting purposes, made in the Schwartz furnace at your works, on June 12, 1903.

A charge of 1000 pounds, consisting of 600 pounds No. 2 charcoal pig iron, selected because of its low silicon; 325 pounds Stewart pig iron (coke), and 75 pounds steel scrap was placed in the furnace and the blast turned on.

The analysis of the materials is as follows:

	Charcoal iron.	Stewart (coke) iron.	Steel scrap.
Silicon	0.89	1.05	0.05
Manganese	0.60	0.17	0.42
Phosphorus	0.283	0.045	0.06
Sulphur	0.018	0.022	0.035
Total carbon.....	3.95	4.05	0.09

The composition of the charge would be as follows:

Silicon	0.88
Manganese	0.45
Phosphorus	0.189
Sulphur	0.021
Total carbon.....	3.69

This composition approximates the bulk of the mixtures used in this country for malleable casting work.

As I desired to note whether the Schwartz furnace could be handled as a melter only (a very important point in malleable practice), the air pressure was kept comparatively low during the first half of the test, or $1\frac{1}{2}$ pounds. When it was noted that the process could be kept simply a melting one when desired the pressure of the blast was raised during the third quarter to 2 pounds, and finally, in the fourth quarter, the blast was $2\frac{1}{2}$ pounds, and the furnace was tilted so that the blast was allowed to impinge directly upon the melted metal, thus refining it considerably. This action was well illustrated in the test plugs taken off during the operation. The first three cast, while simple melting and heating were going on, were quite gray, the metal cast at the completion of the operation being white and of the proper composition.

The first test plug was poured 40 minutes after charging, the next 20 minutes thereafter, the third 17 minutes after this, and the heat poured 18 minutes later, the total time consumed being 1 hour and 34 minutes; 940 pounds of metal were taken out, showing a melting loss of 6 per cent., which is very good for such small quantities. Analysis made of the castings poured from this heat showed the following results:

Silicon	0.51
Phosphorus	0.188
Sulphur	0.034
Manganese	0.15

Physical tests were also made of two test bars made from this heat, and showed the following results:

Test bar No. 1.....	32,640 pounds tensile strength.
Test bar No. 2.....	34,488 pounds tensile strength.

I may add that had the refining been allowed to take place earlier in the operation the time of melt would undoubtedly have been brought within one hour. It is, however, a better policy to melt without refining until the skimming off of the slag. A higher blast pressure might be used at the very outset, and this would hasten the process considerably without undue oxidation.

From the remarkable flexibility of the process a reducing, neutral or oxidizing flame being produced at will, the action of the blast being indirect or direct upon the metal, as wished. I would hold that a method of this kind

would be very desirable where comparatively small amounts of metal are to be handled.

RICHARD MOLDENKE.

A 12-inch test bar was tested for deflection, and the following results were found:

Under load of 500 pounds.....	deflection 0.02 inch.
Under load of 1,000 pounds.....	deflection 0.03 inch.
Under load of 1,500 pounds.....	deflection 0.045 inch.
Under load of 2,000 pounds.....	deflection 0.065 inch.
Under load of 2,450 pounds.....	deflection 0.08 inch.

The latter figure seemed to be its elastic limit. The bar broke between 3550 and 3600 pounds, transverse breaking strength.

Imports and Exports of Iron and Steel.

The report of imports and exports for July has just been issued by the Bureau of Statistics of the Department of Commerce and Labor. The figures show that the imports of iron and steel during July fell off materially, the total, excluding ore, being 90,171 gross tons, against 150,746 tons in June. The imports for the seven months ending July as a matter of course aggregate considerably more than for the corresponding period of 1902. The comparative figures for the month and the seven months are as follows:

Imports of Iron and Steel.

Commodities.	July,		Seven months.	
	1903.	1902.	1903.	1902.
Gross tons.	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron.....	38,046	62,156	490,497	177,763
Scrap	3,588	12,704	65,925	48,650
Bar iron.....	3,465	3,726	26,141	12,030
Rails	3,686	7,753	76,018	21,475
Hoop, band and scroll	227	290	685	2,958
Billets slabs, bars,				
&c., steel in forms				
n. e. s.....	33,070	37,150	209,283	123,222
Sheets and plates...	1,154	262	5,690	3,860
Tin plates and terne				
plates	5,178	3,143	30,657	39,660
Wire rods.....	1,627	2,311	12,031	11,107
Wire and articles				
made from.....	611	162	2,893	2,080
Chains	72	43	282	190
Anvils	47	19	101	66
Totals	90,171	129,719	920,203	443,070

The values for the above periods bear the same relation as the quantities. The total value of imports of iron and steel, not including ore, in July was \$3,529,676, against \$4,162,183 in July, 1902. For the seven months ending with July, 1903, the total value was \$28,849,425, against \$19,333,446 in the corresponding period of last year.

The exports, so far as coarse products are concerned, are running along about as they have been, July showing a gain of only 672 tons over June. The comparative figures for the quantities exported during July and the seven months' period are as follows:

Exports of Iron and Steel.

Commodities.	July,		Seven months.	
	1903.	1902.	1903.	1902.
Gross tons.	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron.....	1,739	2,926	9,256	19,672
Scrap	273	566	2,579	6,240
Bar iron.....	309	274	12,414	16,512
Wire rods.....	1,896	2,639	16,269	9,737
Steel bars.....	3,035	890	12,603	6,166
Billets, ingots, blooms	153	396	805	1,330
Hoop, band, scroll...	51	128	1,187	1,268
Iron rails.....	93	1	494	177
Steel rails.....	654	5,804	4,403	54,017
Iron sheets and plates	1,138	381	2,386	2,164
Steel sheets and plates	501	1,548	7,683	9,454
Tin plates and terne				
plates	2	176	164	1,210
Structural iron and				
steel	3,185	2,077	19,145	38,944
Wire	8,432	7,800	62,604	59,694
Cut nails.....	880	553	4,886	4,556
Wire nails.....	4,479	2,699	18,304	14,994
All other nails, in-				
cluding tacks.....	163	113	1,296	1,009
Totals	26,983	28,971	176,478	247,144

The total value of the exports of iron and steel and manufactures thereof, not including ore, in July was \$9,021,668, against \$7,931,912 in July of last year. The total value for the seven months ending July was \$57,103,491, against \$57,263,304 in the corresponding period of last year.

MANUFACTURING.

Iron and Steel.

We are officially advised that the Bessemer plant of the Republic Iron & Steel Company, at Youngstown, Ohio, which was started up on Monday, August 17, is working very satisfactorily and has not been compelled to close down for repairs.

Furnace No. 2 of the Columbus Iron & Steel Company, at Columbus, Ohio, which has been out of blast for repairs for the last 30 days, is now being relined and will probably resume operations about October 1.

The American Tin Plate Company are building a pumping station near their Jonesboro, Ind., factory, to help along the supply of natural gas.

The Shenango Iron & Steel Company of Sharon, Pa., which purchased the Wheatland Rolling Mills, at Wheatland, Pa., have secured a charter. Several Pittsburgh parties are interested in this new company.

The Board of Trade of Vincennes, Ind., have given \$10,000 and the city \$5000 to the National Rolling Mill Company toward a new plant estimated to cost \$75,000.

The Carnegie Company's works at South Sharon, Pa., have completed extensive repairs on the different mills and will shortly be started up. New engines are being placed in the skelp mill. The blast furnace is being relined and will be put in blast about September 15.

The Shelby Tube Company's plant at Greenville, Pa., is closed down at present for the purpose of installing new machinery.

The repairs on the furnace of the Sharpsville Iron Company, at Sharpsville, Pa., are now completed and the stack has been put in blast.

Two of the three stacks of the Wellston Iron & Steel Company are at present out of blast and will probably not resume prior to January 1 next.

M. H. Treadwell & Co. of 95 Liberty street, New York, have just booked an order from the Illinois Steel Company branch of the United States Steel Corporation for five large cinder cars. They are to be used at the South Chicago plant.

The Indiana mill of the Republic Iron & Steel Company, at Muncie, Ind., has resumed after the summer shut-down with 800 employees. To be prepared against the giving out of natural gas the boiler plant has been equipped with oil burners, which can be used with economy owing to the proximity of the mills to the oil field.

The Shenango Iron & Steel Company, who have taken over the Wheatland mill at Wheatland, Pa., contemplate some improvements and additions to this plant which will be taken up in a short time.

The new open hearth plant of the United Steel Company, at Canton, Ohio, is practically completed and will probably be put in operation this week. The plant contains three 45-ton open hearth furnaces, sheet and tin bar, plate and skelp mills. The sheet and tin bars will be largely used by the Berger Mfg. Company and the Carnahan Tin Plate Company, these two concerns being joint owners of the plant.

The 8-inch mill of the Republic Iron & Steel Company, at Toledo, Ohio, has been put in operation after a long idleness, due to an explosion. The 10 and 18 inch mills are idle for repairs.

General Machinery.

The York Mfg. Company of York, Pa., have secured an order for the machinery for the ice plant of the Bowling Green Brewery & Ice Company, Bowling Green, Ky.

The Waterbury Mfg. Company of Waterbury, Conn., have let the contract for an additional factory to provide additional facilities for the manufacture of brass goods. The new building will be of brick, 50 x 112 feet, and five stories high, with basement.

The Waltham Machine Works of Waltham, Mass., manufacturers of small machinery for watch, clock and similar factories, have broken ground for an addition to their factory. The new building will be of brick, 65 feet long, one story and a basement, which will make it in reality a two-story structure.

The Automatic Haulage Company, Terre Haute, Ind., who operate works in Indiana and Illinois, expect to erect shops in Terre Haute for the manufacture of an endless rope haulage for use in mines, quarries, brick plants, &c., which is automatic in its workings. In about 60 days the company will be ready to take up the purchase of machinery, none of which has as yet been secured. A. D. Scott is president, and the office is located in the Rose Dispensary Building.

Complete foundry and machine shop equipment, including an engine of about 30 horse-power capacity, is required by a newly organized company of which Frank Romans of Cardington, Ohio, is president. The company have a capital stock of \$25,000 and will erect a plant at Edison, Ohio, for general machine and foundry work. None of the machinery has been purchased, and it is not yet known just what the requirements in the way of mechanical equipment will be. W. G. Haas of Edison is secretary.

The Baltimore & Ohio Railroad have placed an order with the American Locomotive Company for a tandem compound locomotive that will be, when completed, the heaviest ever built in this country. It is known as the Mallet articulated type, and modified examples are being used abroad to some extent, none, however, being of the size of the Baltimore & Ohio engine. The engine is built with two cylinders, the one forward being the high pressure, while the rear one is the low pressure. The total weight of the engine resting on the drivers is 285,000 pounds. The locomotive is being built as an experiment and will be used as a helping engine on some of the heavy mountain grades to demonstrate its usefulness in this class of service. It is expected to have the locomotive completed in time for exhibition at the St. Louis World's Fair. The engine is a new type, having 12 drivers of two sets of six each, one set being under the cab and one under the extreme front, the two being separated by the low pressure cylinders.

The Lovell Machine Company, who recently moved their plant from Fitchburg to Gardner, Mass., where they leased the entire second floor of the C. O. Stair mill, have their machinery in place and are about ready for business. A blacksmith shop, 16 x 24 feet, and an office building are being erected.

The American Roller Bearing Company, whose plant at Boston was recently burned out in the great South Boston factory fire, have just closed a five years' lease with W. W. Stall, president and manager of the Factory Exchange of Boston, for the large and well arranged shop formerly occupied by the Tripp Metallic Packing Company, at South Framington, Mass. The concern are fitting up on an enlarged scale to take care of the rush of orders resulting from General Manager McCutchen's recent Western trip, and expect to fulfill all contracts promptly.

At a meeting of the recently organized Stickel Machine Company of Williamsport, Pa., August 10, it was decided not to erect a plant at the present time, but to select a central shipping point, solicit bids from manufacturers for the separate parts, and open up an assembly room, where the journal bearings will be put together and orders filled. Owing to the demand for these bearings, the company decided that this would be the most expeditious course to pursue, that they might fill orders as quickly as possible, and take their time for the erection of a plant.

The Toledo Machine & Tool Company, Toledo, Ohio, have purchased a 2500-pound and a 1500-pound steam hammer, and 125 horse-power water tube boiler, for their proposed new blacksmith shop, 70 x 100 feet.

John T. Maguire, successor to the Mossberg & Granville Mfg. Company, Providence, R. I., advises us that the plans of the new company are not yet settled, other than that the business will be continued in the present quarters.

The Taylor Machinery Company, Aurora, Ill., manufacturers of corn husking and shreading machines, are looking for a good location for a new plant, with good shipping facilities, cheap power, and plenty of skilled labor, with as little danger of labor troubles as possible. They expect to employ from 100 to 200 hands in their proposed new plant, and upon completion of the building will require some additional wood and metal working machinery.

The Reading Machine & Tool Company of Reading, Pa., have installed new machinery which increases the efficiency of their equipment considerably. They now possess an excellently equipped machine shop and electroplating plant, which enables them to perform economically all kinds of special machine work. At present they are engaged in the production of automobile parts for some of the largest builders of horseless vehicles. This class of work they do by estimate from drawings. The company also specialize on tool making machinery and produce Jackson's patent tools, tool holders, boring tools, reamers, &c.

The Youngstown Engineering Company, Youngstown, Ohio, builders of electric traveling cranes, general foundry and engineering work, declined to sign the machinists' scale agreed upon recently in Youngstown, by which machinists received an advance of 5 per cent. However, after a conference the matter has been adjusted and the firm have a full force of men at work. The company have some very large contracts and are running their shops to full capacity.

Power Plant Equipment.

The Pickering Governor Company of Portland, Conn., are about to erect a new building, with a frontage of 230 feet, and with wings, respectively, 140 and 80 feet, a portion of the structure to have two stories. There will also be a central wing, in which will be installed a power plant.

The Angell Mfg. Company, organized at Franklin, Pa., to manufacture oil well supplies and specialties in brass and steel, are in the market for a 25 horse-power gas engine. The company advise us they have already purchased the rest of their machinery. E. J. Beatty is secretary.

The new American Steam Turbine Company, recently organized at New London, Conn., have decided not to build a new plant at present, and have leased the plant formerly occupied by the National Steam Economizer Company, at Thamesville.

J. Redding of New Castle, Pa., and Dr. J. W. Davis of Ander-

son, Ind., have organized the Anderson Rotary Engine Company, to manufacture an engine of Mr. Redding's invention, which can be operated by steam or gasoline.

The recent fire at the plant of the Enterprise Boiler Company, Youngstown, Ohio, burned out the erecting shop, engine and toolroom, causing a loss of about \$25,000. The punching and forging departments were uninjured, and by securing power from their neighbors the company were enabled to get these departments in operation shortly after the fire. While the company will be somewhat inconvenienced in completing their contracts for a few weeks, they will at the end of that time be in shape to take care of their customers, as usual.

The Bellaire Boiler Works, Bellaire, Ohio, will rebuild their plant, which was recently destroyed by fire.

The Buckeye Gas & Gasoline Engine Company have been organized at Aurora, Ill., to manufacture gas and gasoline engines. The capital stock of the company is \$20,000.

Bids will be received until September 28 by the Supervising Architect, Treasury Department, Washington, for a low pressure steam heating apparatus for the United States Court House and Post Office at Fergus Falls, Minn.

Bridges and Buildings.

Chas. H. Haas has been appointed receiver of the Wabash Bridge & Iron Company of Wabash, Ind. The liabilities of the company are placed at \$300,000. The assets are put at about \$75,000. The assignment came as a surprise, for the company have been doing a large business. The creditors are banks in Indianapolis, Chicago, Cincinnati, Cleveland, New York, and in Indiana at Peru, Bluffton, Delphi, Peoria, Monticello, Marion, Anderson and Muncie. The officers are: S. H. Godman, manager; John B. Latchem, president; W. S. Hood, secretary; Wm. Dempsey, treasurer. Mr. Godman owned 80 per cent. of the stock. He is also a stockholder in the Anderson Malleable Iron Works of Anderson, Ind.

The West Virginia Bridge & Construction Company of Wheeling, W. Va., whose plant at Glenn's Run, a suburb of Wheeling, was put in operation last December, are running their works to full capacity. The location is an exceptionally good one, owing to the large amount of land held by the company, as well as superior yard and shipping facilities. The company already employ 175 men and have on their books contracts for large tonnage. The capital of the company is \$150,000, with no indebtedness, and the charter gives the privilege of increasing the capital stock to \$500,000. The company's facilities are such that they are in a position to do any class of structural work, from bridges to steel office and factory buildings and tank work. The company are completing a large new fire proof annex to the Joseph Horne Building in Pittsburgh and have several contracts for other structures of a similar kind. The officers of the company are: Edwin Hazlett, president; George A. Laughlin, vice-president; J. H. Barrett, general manager; Charles F. Paxton, secretary and treasurer.

Foundries.

The new plant of the Rosedale Foundry Company, Allegheny, Pa., is in partial operation, and will be running full in a short time. The machine shop is running partly, and as soon as new additional machinery has been installed it will be put on full time. The main building, containing the molding floor and machine shop, is 98 x 460 feet. It is commanded by one 25-ton crane, two of 20 tons capacity each and two of 5 tons capacity each. All these cranes are electrically operated. The company advise us that all new machinery for their plant has been purchased.

The Central Malleable Iron Company of Decatur, Ill., have been closed down for two weeks to permit the rebuilding of furnaces and other repairs. The time of the cessation of work in the foundry will also be utilized in taking the annual inventory.

The foundry of the Thomas D. West Foundry Company, Sharpsville, Pa., is closed down for repairs and for the installation of considerable new machinery.

Hardware.

The O. S. Kelly Mfg. Company of Springfield, Ohio, makers of farm machinery and traction engines, are contemplating the removal of their plant to South Bend, Ind.

J. and J. D. Oliver, the owners of the Oliver Chilled Plow Works, of South Bend, Ind., have acquired control of most of the property along the West Race in that city, and have a force of men at work clearing the ground preparatory to very extensive improvements. They will establish a mammoth electric power plant and utilize the vast water power of the St. Joe River for generating electricity for the Oliver Chilled Plow Works and the Oliver Hotel. It is proposed to establish a plant of the most modern type.

The Coquillard Wagon Works have removed their plant from South Bend, Ind., to Henderson, Ky., to be near the lumber market. A number of South Bend employees went with them, including Kirk Perley, who will have the management of the plant.

The C. H. Michael Mfg. Company of Laporte, Ind., have taken in the Farmers Mfg. Company, a more recent concern, and have been capitalized at \$75,000. They will carry on a general manufacturing business. The Board of Directors include C. H. Michael, R. T. Valkenburg, Lemuel Darrow, William Crichton, M. I. Michael, D. C. Anderson and K. F. Olin.

The George R. Carter Company, Connersville, Ind., have been incorporated, the incorporators being George R. Carter, Sarah J. Carter and Curtis Withrow. The company will manufacture carriage specialties and harness. The capital stock is \$35,000.

The Columbus Handle & Tool Company, Columbus, Ind., will build a branch factory at Madison, and may transfer their main plant there. Nearly all the small ash timber has been cut away in the territory surrounding Columbus.

The American Buggy Top Company have been incorporated at Jackson, Mich., with a capital stock of \$10,000, to manufacture vehicle tops and trimmings, including backs, cushions, storm aprons, dust hoods, &c. The officers of the company are: Geo. W. Luke, president, and H. H. Christie, secretary and treasurer. A two-story brick factory is now being erected by the company at Jackson.

The F. P. Smith Wire & Iron Works, manufacturers of ornamental and structural iron, art brass and wire work, Chicago, have secured the contract for equipping the Burtis Opera House, Davenport, Iowa, with two stairway fire escapes. The stairs are of the truss rod design, made of steel bars, with the corners turned upward. Stairway escapes for a number of the Chicago theatres, including the Illinois, La Salle and Grand Opera House, were also installed by this company.

The Wilcox Mfg. Company, Aurora, Ill., are erecting an addition to their plant, 80 x 150 feet, in order to better handle their increasing trade.

The National Association of Wagon Manufacturers held a special meeting at the Auditorium Annex, Chicago, August 26, at which time various matters of interest to the trade were discussed by the members present. An interesting feature was an address presented by W. C. Nones, president of the Kentucky Wagon Mfg. Company, Louisville, Ky., on strike insurance. It was decided at the meeting to hold the annual convention in Chicago, November 18.

The Buffalo Wire Goods Company have been formed at Buffalo, N. Y., and will manufacture wire goods of all descriptions, including kitchen and hardware wire goods. The company were organized by C. H. Hutchins, formerly connected with a firm manufacturing similar goods at Worcester, Mass., and will have a capital stock of \$60,000. A. H. Beam, an inventor of wire articles, will be general superintendent of the factory, which is to be erected on Niagara street.

The Parker Wire Goods Company, Worcester, Mass., who were incorporated in June, 1901, with a capital of \$10,000, have recently increased their capital to \$15,000. A large part of this additional capital goes into new machinery and improved plant, to enable them to take care of their enlarging business.

The Marine Hardware & Equipment Company, South Portland, Maine, advise us that they are rapidly getting their plant into full operation and are now producing forgings to a limited extent. They are at present making goods only on orders, but expect soon to be in a position to largely increase their output.

Miscellaneous.

Upon application of a majority of stockholders of the Heating, Ventilating & Foundry Company of Wheeling, W. Va., the courts have decided to appoint a receiver. The company operate a foundry at Elm Grove, near Wheeling, and were promoted by O. L. Badger of Pittsburgh.

The Wright & Colton Wire Cloth Company are about to start up the last of their wire rope machines, which will give the company a complete line of wire ropes. The department is at the Palmer, Mass., plant of the company, where is located a wire mill which will furnish the rope wire, drawn from imported rods, which are stated to be the best for rope purposes.

The Knox Automobile Company of Springfield, Mass., have their new building well toward completion. The structure is of brick, 50 x 100 feet, and four stories. It will be occupied as a paint shop and blacksmith shop.

The improvements to be made to the shops of the Nashville, Chattanooga & St. Louis Railway, Nashville, Tenn., have been greatly exaggerated by the daily press. The only addition to be built is a toolroom, 31 x 47 feet.

The Pittsburgh Coal Company of Pittsburgh are reported to have bought 4500 acres of first pool coal lands from Henry W. Oliver of Pittsburgh, at a price said to be about \$1,000,000. The tract lies near Findleyville, Pa.

The Eastern Electric Supply Company of West Chester, Pa., who recently took over the property of the defunct Sun Metallic Telephone Company, are meeting with success and have increased their working force to 61.

The Pittsburgh Wire Specialty Company of Pittsburgh have applied for a charter. The incorporators are R. T. Tannehill, H. F. Mercer, Walter Sullivan, Frank Link and Harry Weisberger.

The Oldbury Electro Chemical Company of Niagara Falls have awarded the contracts for the erection of four new factory buildings immediately opposite their present works on the easterly end of the lands of the Niagara Falls Power Company. The buildings will be from 100 to 125 feet long and 45 feet wide, brick and iron being the materials to be used. The Oldbury Company are now erecting a new office building and also rebuilding the structure recently destroyed by fire.

Meeting of Independent Sheet Mills.

PITTSBURGH, Pa., Sept. 2, 1903 (*by Telegraph*).—A meeting of the independent sheet mills that sign the scale of the Amalgamated Association was held in the Hotel Lincoln, Pittsburgh, on Tuesday, September 1, for the purpose of taking up the question of asking the Amalgamated Association to remove the limit of output in union sheet mills, and also to get other concessions from that organization which will allow union sheet mills the same privileges enjoyed by nonunion sheet mills, most of which are operated by the leading interest. The meeting was well attended, practically all the independent union sheet mills being represented in person or by letter.

James A. Campbell of the Youngstown Iron, Sheet & Tube Company acted as president. A committee was appointed, consisting of James A. Campbell of Youngstown Iron, Sheet & Tube Company; W. E. Lloyd of Muskingum Valley Steel Company, Zanesville, Ohio; Ed. Langenbach of Berger Mfg. Company, Canton, Ohio; and George M. Verity of American Rolling Mill Company, Middletown, Ohio, to take up with the Amalgamated Association the matter of having the limit of output in union sheet mills removed; also that sheets 22 to 24 gauge double be based at the same number of pairs for seven heats as 25 gauge and lighter; also that union sheet mills start work at 12.05 Monday morning, and close at 8 a.m. Saturday morning. This would allow changes of rolls and cleaning up of mills to be done on Saturday instead of Sunday, as would be the case should the limit of output be removed, which would necessitate the sheet mills working up to 2 o'clock Saturday afternoon. It was also decided to request the Amalgamated Association to cancel foot note No. 15 in the sheet mill hands' scale, which reads as follows: "It is agreed that no more than three changes in the classification of any sheet or jobbing mill can be made during the scale year." Instead of this clause the union sheet mills desire that classification of mills be allowed as often as necessary.

The independent sheet mills have formed a permanent organization, to be known as the Independent Sheet Manufacturers' Association. Offices will be opened up, and James A. Campbell of Youngstown has consented to act as temporary president. A secretary will be appointed at once, and it is the intention of the association to take up matters from time to time affecting the interests of the members.

In regard to the first request of these sheet mills that the limit of output be removed, we can state that a conference of the sheet mill workers of the Amalgamated Association was held in Pittsburgh on Monday and Tuesday, delegates being present from all the union sheet mills. The matter of removing the limit of output was put to a vote of the delegates, who decided against it, stating that to take this action now would disturb scale conditions in the sheet mills, and that it was a matter to be taken up for settlement at the annual convention of the Amalgamated. Whether the independent sheet mills will insist that the limit of output be removed, and also that the other concessions noted above be granted is a matter for the future, but it is not improbable that the concessions asked will be made an issue with the Amalgamated Association at an early date. It is said that mills working under the limit of output arrangement are at a considerable disadvantage in competing with nonunion sheet mills where no limit of output is in effect. The limit of output in union sheet mills is governed by footnote No. 3 in the sheet mill hands' scale, which reads as follows: "That the limit of output per turn on three-turn mills be nine heats, and on two-turn mills ten heats."

It is probable that a conference will be held at an early date between committees from the manufacturers and the Amalgamated to take up these matters more fully.

The Westinghouse Electric & Mfg. Company have started the fires in the boilers of their large new foundry at Trafford City, near Pittsburgh. This foundry, which is the largest in Western Pennsylvania, will soon be started up in full.

Iron and Industrial Stocks.

The past week has been one of general dullness, the sales on the New York Stock Exchange having been smaller than for a long period. The fluctuations have been confined in narrow limits. The only development of importance has been the declaration of 2½ per cent. dividend on the preferred stock of the American Can Company. This declaration was without special effect on the price of Can stocks. Steel, preferred, during the week sold down to 69¼ and up to 71½; common, 22½ to 23¾; Republic, preferred, 64¼ to 67; Tennessee Coal, 41½ to 44; Colorado Fuel, 52 to 55½.

A plan for the reorganization of the Consolidated Lake Superior Company is being prepared, Edward J. Berwind of Philadelphia and Alvin W. Krech, president of the Equitable Trust Company of New York, actively co-operating in arranging its terms, which are as yet in the formative stage. It is understood that the property will be sold to a new company, possibly entitled the Lake Superior Company, with capital stock probably not exceeding \$40,000,000, contrasting with the \$102,000,000 (\$28,500,000 preferred) of the existing company. The shareholders of the Consolidated Lake Superior Company will, it is reported, be allowed to exchange their shares for stock in the new company only on payment of an assessment of \$8 per share. The assertion comes from Philadelphia that the proposed reorganization will be contested and opposed by the minority stockholders, who, it is declared, will go into the Courts and demand that all affairs of the company and the proceedings of their officers and directors be laid bare. They will ask that a full statement of the company's operations since the organization in 1897 be furnished, and if it shall be found that unearned dividends have been declared they will institute proceedings against the directors to recover the sums alleged to have been illegally paid out.

The stockholders of the United States Glass Company of Pittsburgh will hold a special meeting on October 27, to take action on the proposed reduction of the capital stock from \$5,000,000 to \$3,200,000, thereby retiring the entire issue of \$1,000,000 preferred, and also \$800,000 of the common stock, and the creation of a bond issue of \$770,000, to retire the outstanding preferred stock with its accumulated dividends.

The annual meeting of the stockholders of the Pittsburgh Stove & Range Company will be held in Allegheny, Pa., on Monday, September 7.

The July statement of the Columbus & Hocking Coal & Iron Company shows surplus earnings of \$13,397, a decrease over June of \$3780. Shipments for July decreased 26,541 tons.

President Assmann, of the American Can Company, has given out the following statement: "The net sales for the first five months of the fiscal year increased more than \$1,500,000 over the same period last year. The increased earnings are largely due to the concentration and improvements in plants and machinery which have taken place during the last 18 months. These changes have enabled the company to produce goods of a better and more uniform quality and at a lower cost. The company have ample working capital and discount all their bills. The vote of the Board of Directors in the declaration of the dividend was unanimous."

Dividends.—The United States Glass Company of Pittsburgh have declared the regular semiannual dividend of 4 per cent. on preferred stock, payable September 10.

The Republic Iron & Steel Company have declared the regular quarterly dividend of 1¼ per cent. on their preferred stock, payable October 1. Books close September 21 and reopen October 22. The stockholders will hold their annual meeting in Chicago on October 21.

American Can Company have declared a dividend of 2½ per cent. on the preferred stock, payable September 30. Books close September 16 and reopen October 1.

In regard to the reported reduction in wages of tonnage men in the Bessemer steel plant of the Republic Iron & Steel Company, at Youngstown, Ohio, we may state that these are due to changed conditions. The old scale was based upon a blooming mill which rolled 4-inch and all the product of the Bessemer plant on the blooming mill, finished billets, slabs or blooms. At the present time the blooming mill and Bessemer mill have been more than doubled in capacity, and instead of rolling 4-inch billets on the blooming mill, these are now rolled on a separate mill built for the purpose. Under the new arrangement the men will earn as much money as before, providing the converting and blooming mills turn out the tonnage expected. The new tonnage rates affected only 12 men.

The relief association, composed of employees of the Republic Iron & Steel Company at the Brown-Bonnell Works, and the Bessemer steel plant at Youngstown, Ohio, will probably purchase a large block of the preferred stock of the Republic Company. This association has considerable funds to its credit and regards the preferred stock as a good investment.

The Iron and Metal Trades.

An improving inquiry can be reported for Manufactured Iron and Steel generally. The conditions which have governed trade in finished products have been unsatisfactory during the summer months, but it is now quite confidently expected that a favorable change is due. Autumn requirements are usually sufficient to bring about a good increase in the volume of business. Seasonable products, such as Wire Nails and Wire Fencing, are even now beginning to feel a better demand. In the case of Structural Shapes, Plates and some other products, a great deal of deferred business, held up on account of labor troubles and the unsatisfactory condition of the market for securities, will soon come up for attention.

Pittsburgh advices are pitched on a more cheerful tone than for some months, transactions being on a larger scale and showing more confidence among buyers. The influence of good crops in the West and South, which will be marketed at high prices, is beginning to be felt. It is recognized that the possibility exists of some damage through an early frost, but this is a contingency which may not occur. Reports from other Iron markets are generally of an encouraging character. The East is at present the least favored in this respect.

Prices of finished products are well maintained, with the exception of Light Sheets, Bar Iron and some minor products.

Transactions in Foundry Pig Iron are not on so large a scale as last week, and some disappointment is felt on this account. Nevertheless, the market has by no means relapsed into dullness. A great deal of buying is in progress, but it consists of small lots, showing that consumers are conservative in anticipating their requirements and will be until they are convinced that bottom has been reached. The fact that so much buying has recently been done shows that the prices now prevailing are considered reasonable, and it is to be hoped that they can be maintained. During the prevalence of high prices costs were considerably increased, and with the exception of coke these costs still prevail. Quite a number of furnace owners find that at current prices their margin of profit has disappeared and preparations are under way for the blowing out of a considerable number of stacks. The production will thus be reduced, as the furnaces which are now blown out will remain cold until either the demand for Iron increases or the principal elements of cost are reduced, which may not be for some months.

The Southern furnace companies are urging the railroads to reduce the freight rate on Pig Iron to Northern markets. This matter will come up on Friday. If a reduction is made it will lower the price of Southern Iron in Northern markets by the amount of the reduction.

An interesting contest is possible between the independent Sheet mills and the Amalgamated Association. The mills have asked for changes in some of the union rules to enable them to compete on better terms with non-union mills, but their request has been refused.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type.
Declines in Italics.

At date, one week, one month and one year previous.

	Sep. 2, 1903.	Aug. 26, 1903.	Aug. 5, 1903.	Sep. 3, 1902.
PIG IRON:				
Foundry Pig No. 2, Standard, Philadelphia	\$16.50	\$16.75	\$17.25	\$22.00
Foundry Pig No. 2, Southern, Cincinnati	14.75	15.00	15.25	21.25
Foundry Pig No. 2, Local, Chicago	16.50	16.50	17.25	23.00
Bessemer Pig, Pittsburgh	17.35	17.85	18.85	21.75
Gray Forge, Pittsburgh	15.50	16.00	16.15	20.50
Lake Superior Charcoal, Chicago	19.00	19.00	21.50	26.00
BILLETS, RAILS, &c.:				
Steel Billets, Pittsburgh	27.00	27.00	27.00	31.00
Steel Billets, Philadelphia	28.00	28.00	28.25	27.50
Steel Billets, Chicago	28.00	28.00	28.00	29.50
Wire Rods, Pittsburgh	35.00	35.00	35.50	36.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL:				
O. Steel Rails, Chicago	14.50	16.50	17.00	18.50
O. Steel Rails, Philadelphia	16.50	16.75	18.75	21.50
O. Iron Rails, Chicago	18.00	18.50	18.50	24.50
O. Iron Rails, Philadelphia	19.00	19.00	19.50	24.00
O. Car Wheels, Chicago	21.00	21.00	21.50	21.00
O. Car Wheels, Philadelphia	19.00	19.00	19.50	20.00
Heavy Steel Scrap, Pittsburgh	19.00	17.00	19.00
Heavy Steel Scrap, Chicago	14.00	14.50	15.50	18.00
FINISHED IRON AND STEEL:				
Refined Iron Bars, Philadelphia	1.60	1.60	1.65	1.92
Common Iron Bars, Chicago	1.55	1.55	1.60	1.80
Common Iron Bars, Pittsburgh	1.65	1.60	1.65	1.80
Steel Bars, Tidewater	1.70	1.70	1.70	2.00
Steel Bars, Pittsburgh	1.60	1.60	1.60	1.60
Tank Plates, Tidewater	1.78	1.78	1.78	2.00
Tank Plates, Pittsburgh	1.60	1.60	1.60	1.75
Beams, Tidewater	1.73½	1.73½	1.73½	2.10
Beams, Pittsburgh	1.60	1.60	1.60	2.00
Angles, Tidewater	1.73½	1.73½	1.73½	2.10
Angles, Pittsburgh	1.60	1.60	1.60	2.00
Skelp, Grooved Iron, Pittsburgh	1.80	1.80	1.85	2.10
Skelp, Sheared Iron, Pittsburgh	1.87½	1.85	1.90	...
Sheets, No. 27, Pittsburgh	2.55	2.60	2.60	2.90
Barb Wire, f.o.b. Pittsburgh	2.60	2.60	2.60	2.90
Wire Nails, f.o.b. Pittsburgh	2.00	2.00	2.00	2.05
Cut Nails, f.o.b. Pittsburgh	2.15	2.15	2.15	2.05
METALS:				
Copper, New York	13.75	13.75	13.00	11.30
Spelter, St. Louis	5.60	5.60	5.50	5.25
Lead, New York	4.12½	4.12½	4.12½	4.10
Lead, St. Louis	4.20	4.15	4.15	3.97½
Tin, New York	27.50	27.70	28.25	27.05
Antimony, Hallett, New York	6.37½	6.37½	6.50	8.00
Nickel, New York	40.00	40.00	40.00	40.00
Tin Plate, Domestic, Bessemer, 100 pounds, New York	3.99	3.99	3.99	4.19

Chicago.

FISHER BUILDING, September 2, 1903.—(By Telegraph.)

One of the significant features of the Pig Iron market is the sales of small lots, which have been made for deliveries extending into March and June of 1904 on the present basis of prices. Most of the business during the week, however, has been for small quantities for September shipment, indicating that stocks in the yards of consumers are unusually light. There have been a few transactions for delivery during the last half of the year; but, as a rule, large consumers of all kinds of Iron—Foundry, Forge, Bessemer and Basic—are now holding off. Both producers and consumers of Pig Iron are anticipating a reduction of freight rates from the South. The fact that the railroads are now demanding the same rate of freight as they were receiving when prices of Pig were \$7 a ton higher is regarded as unfair. A reduction of from 50c. to \$1 a ton has been agitated, and some action is expected to be taken at an early meeting of the traffic managers. A better demand has been experienced for Bar Iron at the lower prices current, but it is also reported that there is a little freer buying of Soft Steel Bars. It is notable that throughout nearly all lines of Steel there is a better feeling with some little increase in business with the exception of Black Sheets, which have been sold at lower prices. Prices seem to be well sustained, and although consumers are still maneuvering for lower prices they have succeeded in obtaining few, if any, concessions. Plates and Structural Material have been especially quiet, as far as new business is concerned, but there has been a more active demand and larger sales of Billets and Rails for quick shipment. There has also been a fair inquiry for Merchant Steel and a good trade in Merchant Pipe. Cast Iron Pipe has also sold a little more readily in small quantities for extensions.

Pig Iron.—An absence of large transactions, an active demand for single cars for immediate delivery and small sales extending through the first six months of 1904 have been the prominent features of the Pig Iron market during the week. The demand has been largely for small quantities, sales of from one to four cars for September delivery, which have been quite general, reflecting the light stocks carried by foundries and other consumers in this section. Even those who have purchased to cover their requirements for the last half of the year have been clamoring for small quantities for immediate delivery, even large consumers being among the number requesting almost immediate shipment. There have been a few sales ranging from 200 to 500 tons, and in a few instances 1000-ton lots, for delivery during the last half of the year, and in one case deliveries extended into March, 1904, and in another instance into June, 1904. But the quantities for such deliveries are insignificant, ranging only from 200 to 400 tons. Large buyers seem to be impressed with the idea that prices must further decline, and are therefore holding off from the placing of orders to cover full requirements for the remainder of the year. Furnaces, however, especially in the South, are disposed to be a little stronger, not only because independent furnaces have been largely sold for several months to come, but because cost sheets show little margin at present prices. Sales of Southern Iron have continued to be on the basis of \$11.50 to \$12 for No. 2, Birmingham. The demand for Northern Iron has also been only moderate, mainly in small quantities on the basis of \$16.50 to \$17 for No. 2, Chicago. There have been further inquiries for Malleable Bessemer and Basic Iron, but no important transactions have been closed. Prices have changed but little during the last ten days. There has been scarcely a transaction of the week worthy of special consideration. High Silicon Softeners and Lake Superior Charcoal Iron have sold in moderate quantities on the basis of quotations. The following are the approximate prices current, f.o.b. cars, Chicago, the outside being for quick shipment and the inside for delivery during the last half of the year:

Lake Superior Charcoal.....	\$19.00 to \$20.00
Northern Coke Foundry, No. 1.....	17.00 to 17.50
Northern Coke Foundry, No. 2.....	16.50 to 17.00
Northern Coke Foundry, No. 3.....	16.00 to 16.50
Local Scotch, No. 1.....	18.00 to 18.50
Ohio Strong Softeners, No. 1.....	18.00 to 18.50
Ohio Strong Softeners, No. 2.....	17.50 to 18.00
Southern Silvery, according to Silicon.....	18.10 to 19.00
Southern Coke, No. 1.....	16.35 to 16.85
Southern Coke, No. 2.....	15.85 to 16.35
Southern Coke, No. 3.....	15.35 to 15.85
Southern Coke, No. 1 Soft.....	16.35 to 16.85
Southern Coke, No. 2 Soft.....	15.85 to 16.35
Foundry Forge.....	14.85 to 15.35
Southern Gray Forge.....	14.35 to 14.85
Southern Mottled.....	13.85 to 14.35
Southern Charcoal Softeners, according to Silicon.....	19.30 to 21.30
Alabama and Georgia Car Wheel.....	25.35 to 27.35
Malleable Bessemer.....	17.00 to 17.50
Standard Bessemer.....	17.50 to 18.00
Jackson County and Kentucky Silvery, 6 to 10 per cent. Silicon.....	20.30 to 22.30

Bars.—There has been an increased demand for Bar Iron in lots of 200, 250 and 500 tons aggregating several thousand tons for delivery during the next 30 to 90 days, sales being made mainly on the basis of 1.55c, Chicago. The relatively low price of Iron is causing some sales at the expense of Steel, which is still held at the old level; but in a number of instances Steel cannot be replaced by Iron, and there has been some little increase in Steel sales, one lot of 2500 tons, one lot of 1500 tons and various lots of from 300 to 500 tons having been closed within the last few days, deliveries extending into 1904. Consumers have not ceased in their efforts to secure concessions, but producers show little disposition to shade the official price. The following are the prices current, f.o.b. cars, Chicago, mill shipment: Bar Iron, 1.55c. to 1.60c.; Sort Steel Bars, 1.76½c. to 1.86½c.; Hoops, 2.06½c. to 2.16½c.; Bessemer Bands, 1.76½c. to 1.86½c.; Angles, under 3 inches, 1.86½c. to 1.91½c., base. There has been some little improvement in the demand for small shipments from local stocks and prices have remained steady. Iron Bars selling at 1.90c. in carload lots and 2c. to 2.15c. in less than carload lots; Soft Steel Bars, 2c. rates; Angles, under 3 inches, 2.10c. rates, and Hoops, 2.40c., base, from store.

Structural Material.—Various Western railroads, including the Northern Pacific, the Burlington, the Northwestern, the Chicago, Milwaukee & St. Paul, the Michigan Central and smaller railroads, have placed orders during the past ten days for bridge material aggregating about 6000 tons, mainly for renewals, and the Northwestern is now in the market for several thousand tons for new structures to be erected at Milwaukee. The orders placed for buildings in this section have been light, there being scarcely a single transaction as much as 500 tons; but there are quite a number of contracts pending, including a family hotel building, an office building, a store in Chicago, the Pennsylvania Depot at Washington, the Masonic Temple at Dayton, Ohio, and other small buildings aggregating several thousand tons. There is also some inquiry for Shapes from railway supply

companies. Consumers are maneuvering to obtain some advantage, hesitating from various causes to close contracts; but, although producers can make prompt shipments, they show little disposition to consider lower prices for mill shipment at least, prices remaining unchanged, as follows: Beams, Channels and Zees, 15 inches and under, 1.75c. to 1.90c.; 18 inches and over, 1.85c. to 2c.; Angles, 1.75c. to 1.90c. rates; Tees, 1.80c. to 1.90c.; Universal Plates, 2c. to 2.25c. Local stocks of all kinds are heavy and the demand shows but little improvement, but prices are well sustained at the recent reduction, sales being made at the following prices: Beams and Channels, 2.10c. to 2.25c.; Angles, 2.10c. to 2.25c.; Tees, 2.15c. to 2.30c., from local yards.

Plates.—Specifications have shown but little improvement and new orders have been light, but there has been more inquiry from car manufacturers and smaller consumers which may result in increased business in the future. Prices continue to be well maintained, as follows, f.o.b. cars, Chicago, mill shipment: Tank Steel, ¼ inch and heavier, 1.75c. to 2c.; Flange, 1.85c. to 2.15c.; Marine, 1.95c. to 2.10c. There has been but little movement from local stocks and the market has remained easy, but without quotable change in prices, which are as follows: Steel, ¼ inch and heavier, 2c. to 2.15c.; Tank Steel, 3-16 inch, 2.10c. to 2.25c.; No. 8, 2.15c. to 2.30c.; No. 10, 2.30c. to 2.40c.; Flange Steel, 2.25c. to 2.40c., all f.o.b. warehouse, Chicago.

Sheets.—The tone of the market has been easy, and although there has been some little increase in business, it has been at the expense of prices. While official prices have been unchanged, nearly all business reported has been at lower prices, mainly on the basis of the following, f.o.b. cars, Chicago, mill shipment: No. 10, 1.96½c. to 2.06½c.; No. 12, 2.06½c. to 2.16½c.; No. 14, 2.16½c. to 2.26½c.; No. 16, 2.26½c. to 2.36½c.; Nos. 18 and 20, 2.41½c. to 2.51½c.; Nos. 22 and 24, 2.51½c. to 2.61½c.; No. 26, 2.61½c. to 2.71½c.; No. 27, 2.71½c. to 2.81½c.; No. 28, 2.81½c. to 2.91½c. Small lots for shipment from local stocks are selling at from 10c. to 15c. over mill prices. Galvanized Sheets have been in fair demand and steady at 75, 10 and 2½ to 75, 10 and 5 discount, mill shipment, while small lots from local stocks have continued to sell at 75 and 2½ to 75 and 5 discount.

Cast Iron.—There has been an improved demand for small quantities from gas and water companies for renewals and extensions, and also a better demand from railroads for construction work and for Culvert Pipe. Among the sales have been 1500 tons of 36's for delivery at an Iowa point and several 100-ton lots of smaller sizes to other Western points, and moderate sales have been made for delivery at St. Louis. Prices for mail orders have continued steady as follows: 4-inch, \$31; 6 and 8 inch, \$30; larger sizes, \$29, in carload lots, for Water, and \$1 per ton higher for Gas Pipe.

Billets.—There has been an improved demand for both Bessemer and Open Hearth Billets, with sales of 3500 tons of 4-inch Bessemer Billets at \$28, and 1500 tons of 1½-inch Bessemer Billets at \$29, f.o.b. Chicago. Open Hearth Billets are selling in round lots at \$28 to \$29, but small lots of Forging Billets have sold at \$32 to \$36, according to analysis, buyer and time of delivery.

Merchant Pipe.—The demand for all sizes of Merchant Pipe continues active, and while the largest interest in the market is able to make reasonably prompt shipments on small and medium sizes, large Pipe is still scarce. Some independent mills, unable to make prompt shipments, have had a number of orders canceled, but other nonassociation mills have taken considerable business. The tone of the market has continued firm. The schedule of discounts is unchanged, as follows, in carload lots, Chicago, base, random lengths, mill shipment:

	Steel Pipe.		Guaranteed Wrought Iron	
	Black.	Galvd.	Black.	Galvd.
Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
½ to ¾ inch.....	66.35	56.35	63.35	53.35
¾ inch.....	68.35	58.35	65.35	55.35
¾ to 6 inches.....	73.35	63.35	70.35	60.35
7 to 12 inches.....	67.35	57.35	64.35	54.35

Less than carloads, 12½ per cent. advance.

Boiler Tubes.—There has been a fair demand from distributors, and with the mills well supplied with orders the market has continued firm, the schedule of discounts for mill shipment being unchanged, as follows:

	Steel.	Iron.
1 to 1½ inches.....	40	35
1½ to 2½ inches.....	55.85	35.85
2½ to 5 inches.....	60.85	45.85
6 inches and larger.....	55.85	35.85

Less than carloads, 12½ per cent. advance.

The order demand for shipment from local stocks has been improved, and prices have been better sustained. The following is the schedule of discounts for shipments from local warehouse:

	Steel.	Iron.
1 to 1½ inches.....	40	35
1½ to 2½ inches.....	50	32½
2½ to 5 inches.....	57½	42½
6 inches and larger.....	50	..

Merchant Steel.—There has continued to be a fair demand for small lots of agricultural specialties and Tire and Spring Steel, both agricultural implement and wagon manufacturers being in the market for moderate amounts from 100 to 200 tons each. There has also been a good demand for Shafting and a better trade in Tool Steel. As a rule, the mills are able to give fairly prompt shipments, and the market has remained steady without change in official prices, which are as follows for mill shipments: Smooth Finished Machinery Steel, 2.01½c. to 2.11½c.; Smooth Finished Tire, 1.96½c. to 2.11½c.; Open Hearth Spring Steel, 2.66½c. to 2.76½c.; Toe Calk, 2.31½c. to 2.46½c.; Sleigh Shoe, 1.86½c. to 1.96½c.; Cutter Shoe, 2.41½c. to 2.61½c. Ordinary grades of Crucible Tool Steel are quoted at 6c. to 8c. for mill shipment; Specials, 12c. upward. Cold Rolled Shafting in carload lots sells at 47 and in less than carload lots at 42 discount from list.

Rails and Track Supplies.—There has been an active demand for moderate amounts of Standard Rails for shipment during 1903, but little business has been transacted for 1904 delivery. The sales during the month of August for delivery during the last four months of the year aggregate 15,000 tons, about 4000 tons having been sold during the last few days, one lot of 2500 tons and one lot of 1500 tons. There has also been some inquiry for export to Canada and Mexico. The tone of the market has continued firm, official prices being unchanged at \$28 for standard and \$27 for second quality, mill shipment. Light Rails have been in good demand and steady at \$34 to \$38. Track Supplies have been more active, some railroads placing orders for part of their requirements for 1904. Prices have remained firm as follows: Splice or Angle Bars, 2c. to 2.10c.; Spikes, 2.10c. to 2.15c.; Track Bolts, 3½ to 3¾ inches and larger, with Square Nuts, 2.85c. to 2.90c.; with Hexagon Nuts, 3c. to 3.10c. From store 10c. to 15c. over mill prices are asked and obtained.

Old Material.—Very little demand for Scrap Iron and Steel has been experienced by dealers from Open Hearth furnaces during the last week, but rolling mills have been purchasing a little more freely; however, offerings are larger as far as railroads are concerned, although country holders are indisposed to sell at present prices. The market is somewhat irregular, prices of Old Iron Rails, Old Steel Rails, mixed lengths, Heavy Steel Melting Scrap and Iron Fish Plates having declined materially, while Railroad Wrought, Busheling and Wrought Pipe, Iron Axle Turnings and Machine Shop Turnings have advanced from 25c. to 50c. per ton. Agricultural Malleable also is only in moderate supply and a little firmer in tone. The following are the prices current per gross ton, f.o.b. cars, Chicago:

Old Iron Rails.....	\$18.00 to \$18.50
Old Steel Rails, mixed lengths.....	14.50 to 15.00
Old Steel Rails, long lengths.....	19.00 to 19.50
Heavy Relaying Rails.....	28.00 to 29.00
Old Car Wheels.....	21.00 to 21.50
Heavy Melting Steel Scrap.....	14.00 to 14.50
Mixed Steel.....	12.50 to 13.00

The following quotations are per net ton:

Iron Fish Plates.....	\$14.50 to \$15.00
Iron Car Axles.....	19.50 to 20.00
Steel Car Axles.....	17.00 to 17.50
No. 1 Railroad Wrought.....	14.25 to 14.75
No. 2 Railroad Wrought.....	13.50 to 13.75
Shafting.....	16.00 to 16.50
No. 1 Dealers' Forge.....	12.50 to 13.00
No. 1 Busheling and Wrought Pipe.....	11.25 to 11.75
Iron Axle Turnings.....	11.50 to 11.75
Soft Steel Axle Turnings.....	11.50 to 11.75
Machine Shop Turnings.....	11.00 to 11.50
Cast Borings.....	5.75 to 6.25
Mixed Borings, &c.....	5.75 to 6.25
No. 1 Boilers, cut.....	12.50 to 13.00
Heavy Cast Scrap.....	13.50 to 14.00
Stove Plate and Light Cast Scrap.....	10.50 to 11.50
Railroad Malleable.....	14.00 to 14.50
Agricultural Malleable.....	13.25 to 13.75

Metals.—While the market for Copper has been firm in tone and prices have advanced, there has been but little, if any, increase in the demand, and the market at the close is quiet, Casting Copper being held at 13½c. and Lake at 13¼c., in carload lots. Spelter has been active and prices have advanced sharply, sales being made on the basis of 5.65c. to 5.70c. for September and 5.60c. for October delivery, and moderate amounts of spot have sold at 5.70c. to 5.75c., Chicago. Pig Tin is held at 30c. in a small way. Lead has continued firm, with a good demand and moderate offerings, prices being nominally unchanged at 4.05c. in 50-ton lots and 4.07½c. in carload lots. Old Metals have been in more active demand and prices of Copper higher. Heavy Cut Copper is selling at 12½c., Red Brass at 11½c., Copper Bottoms at 10¼c., Lead Pipe at 3.80c. and Zinc at 4.65c., spot.

Coke.—While there has been only a moderate demand for either Furnace or Foundry Coke, offerings have been more liberal, and in some instances concessions have been made for early shipment. Dealers note the unsatisfactory conditions of transportation, there being congestion at or near the ovens, causing considerable delay in making shipments. Connellsville, Pocahontas and New River 72-hour

Foundry Coke are being sold at \$2.75 to \$3.25, and Furnace Coke at \$1.75 to \$2.25 at the ovens.

Zug & Co., Limited, of Pittsburgh, manufacturers of Sable Black and Galvanized Sheets, have appointed James B. Myers, 1532 Marquette Building, Chicago, their representative in the Chicago district.

Rogers, Brown & Co. have been appointed exclusive sales agents for the Tuscaloosa Coke Iron, manufactured by the Central Iron & Coal Company, Tuscaloosa, Ala.

Philadelphia.

FORREST BUILDING, September 1, 1903.

No improvement can be noted in the condition of the Iron trade during the past week. The movement in Pig Iron has been somewhat more active, but prices are uncertain, and in the case of large orders they are not firm. Finished Material is distinctly dull, and as a consequence prices are easy. Plates, Shapes, Steel Bars and other articles that are sold under price agreements are fairly well held, but even in these it is claimed that special means are found by which trade is obtained. On the whole, therefore, the situation is not a pleasant one, neither is there anything in sight likely to bring any marked improvement in the immediate future.

There is plenty of talk of good crops, and of easier financial conditions, and indeed there are reports that the Iron trade is better in some districts. There is undoubtedly a large volume of business in the aggregate, but, whether it is due to increased facilities or to lessened consumption, it is certain that everybody wants business, and in many cases it is so badly needed that a curtailment of work will be inevitable unless something worth while comes in within the next two or three weeks. Recently nearly all the orders have been for small lots, showing that work is getting scarce and that requirements are very much below what they have been for two or three years past. Nevertheless, there should be a considerable demand during the month upon which we have now entered, and while there is not much prospect for better prices, there are strong hopes of enough business being taken to give a good lift for the remainder of the year. It is unfortunate that a report of this kind is necessary, but if the exact facts are to be given, there is no alternative. At the same time many leading concerns express themselves very hopefully in regard to the ultimate outcome.

Pig Iron.—Some large sales have been made during the past week, and it is evident that many of the old contracts are beginning to run out. To-day's prices for Pig Iron look very low compared with those in force during the earlier months of the year, and in some cases buyers are taking good sized lots, although in the majority of cases carloads, 50 and 100 ton lots, are about the limit. What consumers want to find out is in regard to prices. The majority need more or less Iron immediately, but whether they should contract for much or little is a problem difficult for them to solve. There will be a more active market undoubtedly, for the reason that daily requirements must be met by daily purchases. When deliveries have to be taken on uncompleted contracts there is no necessity for buying in quantity, but it is believed that this is past, and that sales will be frequent enough and large enough to establish prices with some degree of uniformity. This has not been the case since before midsummer, but it is now recognized that there is a market, although prices may not be absolutely settled. In the majority of cases sales have been made at about the same figures as during the week previous, say \$16.75 to \$17.25, delivered, for No. 2 X Foundry, a little extra for a few favorite brands in small lots, and a shade less, say about \$16.50, for large lots, deliveries covering the remainder of the year. To-day's prices for Philadelphia and nearby deliveries would be about as follows for ordinary sized lots, large orders at inside or possibly slightly lower figures:

No. 1 X Foundry.....	\$18.00 to \$18.50
No. 2 X Foundry.....	16.50 to 17.50
No. 2 Plain.....	15.75 to 16.25
Standard Mill Irons.....	15.25 to 15.75
Ordinary Mill Irons.....	15.00 to 15.25
Basic.....	15.50 to 16.00

Steel.—Prices are weak, and at the official quotations there is nothing doing in this district. Small and medium sized lots of Basic Steel are taken from local mills at about \$28.50, for nearby deliveries, but 50c. better could probably be done on a good sized order. German Steel is offered at a little under \$27, ex-ship, duty paid, but there is nothing doing of any account either in foreign or domestic Steel.

Plates.—Orders are numerous, but the tonnage is light, and some of the mills have to limit their output, as there is not enough business to keep them going. Orders for large lots are extremely scarce, and, as far as can be seen, prospects of improvement are not good. Day to day business seems to be the rule, with very little work on the books beyond what could be finished in three or four weeks' time. Quotations are as follows for city and nearby deliveries, base prices up to 100 inches: Tank Steel, both Sheared

and Universal, 1.75c. to 1.80c., in large lots; Flange, 1.85c. to 1.90c.; Commercial Fire Box, 1.95c. to 2c.; Locomotive Fire Box, 2.25c. to 2.30c.; small lots, 10c. to 15c. per 100 extra; 100 to 110 inches, 0.05c. extra; 110 to 115 inches, 0.10c. extra; 115 to 120 inches, 0.15c. extra; 120 to 125 inches, 0.25c. extra; 125 to 130 inches, 0.50c. extra; over 130 inches wide, 1c. extra; Plates under $\frac{1}{4}$ inch on edge, 0.10c. extra; under 3-16 inch on edge to No. 8, 0.15c. extra; No. 9, B. W. G., 0.25c. extra; all Sketch Plates, 0.1c. extra; all Circle Plates, 0.2c. extra.

Structural Material.—There is very little change from the conditions which have prevailed for many weeks past. Labor has pretty well killed the building trade for this season, so that a great deal of business has been canceled or postponed. Shipyards are also doing comparatively little, so that the demand for Structural Material is readily met, which is in marked contrast with last year's business. Prices are unchanged, viz.: Beams, Angles or Channels, ordinary sizes, 1.73 $\frac{1}{2}$ c. to 1.80c. for carload lots, with the usual addition for small quantities.

Bars.—The story of the past several weeks may again be repeated almost without variation. There may perhaps be a slight increase in the volume of business, but there is not enough to go around, hence the unevenness in prices. The usual price for Refined Iron is 1.60c. delivered. Some ask more, some take less, according to quantity, quality, &c. Steel Bars are unchanged at 1.73 $\frac{1}{2}$ c. to 1.75c.

Sheets.—There is about the usual demand, but nothing beyond what can be easily met. Prices are unchanged, but a little easy on first-class business.

Old Material.—The market is very dull and prices hardly quotable, as every sale depends upon the circumstances in each individual case. At the low prices now ruling, however, it is thought that a larger business will be done in the near future. For the present, however, bids and offers for deliveries in buyers' yards are about as follows:

Old Steel Rails.....	\$16.50 to \$17.25
Heavy Steel Scrap.....	16.25 to 16.50
Low Phosphorus Scrap.....	24.00 to 25.00
Old Steel Axles.....	18.00 to 19.00
Old Iron Rails.....	19.00 to 20.00
Old Iron Axles.....	21.00 to 22.00
Old Car Wheels.....	19.00 to 20.00
Choice Scrap, R. R. No. 1 Wrought.....	17.00 to 18.00
Country Scrap.....	15.00 to 16.00
Machinery Scrap.....	15.00 to 16.00
No. 2 Light Scrap.....	16.00 to 17.00
No. 2 Light (Ordinary).....	11.00 to 12.00
Wrought Turnings.....	11.50 to 12.00
Wrought Turnings, Choice Heavy.....	13.00 to 14.00
Cast Borings.....	7.75 to 8.25
Stove Plate.....	11.75 to 12.25

The Chateaugay Ore & Iron Company have appointed Milling & Crane of Philadelphia and New York sales agents for the output of Charcoal Low Phosphorus Pig Iron to be produced at the Standish Furnace, Standish, N. Y.

Cleveland.

CLEVELAND, OHIO, September 1, 1903.

Iron Ore.—The report of no important sales of Ore to furnaces is getting monotonous. Such is the case, however, and inquiries have even ceased. The report is that on some small sales to mills the price has been cut. This is generally accepted as the trend of affairs, and already there is talk among the Iron men of reductions in prices when the next schedule is made out. For Ore to furnaces the prices hold at \$4.50 for Bessemer Old Range and \$4 for Bessemer Mesaba. The movement of the Ore down the lakes is easing as to wild cargoes, and the market on the lakes is a little soft. Contract vessels are still active, but it is estimated that the shipment for August is lighter than during August last year. Rates of carriage are unchanged, at 80c. from Duluth, 72 $\frac{1}{2}$ c. from Marquette and 60c. from Escanaba.

Pig Iron.—The better tone in the Pig Iron trade, which was noted a week ago, has continued and increased. The feeling generally is very much stronger. Sales for spot delivery have been steady and strong and the aggregate tonnage has been exceedingly good. Inquiries on good sized contracts have also been coming in freely, and it looks now as if a big buying movement was immediately ahead. The principal demand is in Foundry Iron, but there is also a good call for Malleable, and some inquiry for Bessemer and Basic for fourth quarter has been coming in. In Foundry Iron the market has been steady, and the buying for the week seems to have been confined to lots of a few hundred tons. One sale is indicative. It amounted to 500 tons, and the order called for a carload immediately with a tracer. Southern furnaces have been marketing considerable material in this territory under the same circumstances. The belief is that bottom prices are here. The general state of the market is indicated by the fact that most of the stacks which have been out of blast have resumed operations in the Valleys, and the increased production is not causing any material increase in stocks. The agricultural implement works have started buying. The price for Northern No. 2 is \$16, Valley furnace. Southern No. 2 is bringing \$12,

Birmingham, from association and nonassociation stacks alike, with reports that a few nonassociation furnaces have yielded to the offers of the purchasers for \$11.50, Birmingham. Most of the independent furnaces are fairly well filled with orders. The Northern furnaces have had a good call for Malleable, arising out of the greater activity among agricultural implement works. One sale of 2500 tons was reported and other good sized lots have been sold, with still greater quantities under inquiry. The price holds at about \$16.50, Valley furnace. The call for Gray Forge is about steady and the market firm, with the price ruling about even with No. 2 Foundry. There has been a little better inquiry for Bessemer Iron for fourth quarter delivery, but it would be difficult to quote a price, as the sales have been very small. Basic is still off the market, with comparatively little inquiry for material. The stacks in this territory have practically nothing to sell for the immediate future. With all of the Valley furnaces the supply of Coke is adequate to the needs, as the car supply has somewhat improved. Shipments from the furnaces have been steady and heavy.

Finished Iron and Steel.—In a general way the market in this territory has been sick but is improving. Inquiries on every hand have been considerably heavier, and a good buying movement is forecasted in several aspects of the trade. It has been discovered the past week that a number of the consumers have made contracts for finished products for which the Steel has not been bought, and that others have been running on material previously purchased. The supplies are running short, and new contracts are to be filled. In many instances the consumers have been waiting for lower prices, in which the mills are free to predict they will be disappointed. The larger mills are waiting for the smaller ones to get a little satisfaction on cut price material, that they may give stability to the market by sales at announced association prices. In Steel Bars the trade has been a little heavier. The increased activity in the agricultural implement works has caused good buying, but the conservative consumers are taking Steel hand to mouth and are not contracting. It has been reported the past week that some of the mills have been selling Bar Iron at cut prices, and have been shipping Steel on the Iron contracts. Bar Iron prices have been generally lowered. One sale of considerable tonnage was placed at 1.52 $\frac{1}{2}$ c., delivered, with a stiff freight added. The generality of sales, however, have been made at 1.50c., at the mill. At these low prices sales of Bar Iron have been heavy. In Billets there have been but few sales at the association prices. The price quoted holds at \$27.50, Cleveland. In Sheets there is a little better call for material, and while the contracting has not started afresh the sales of small lots have been steady. The prices have not changed aside from the understood fact that on choice orders any quotation now prevailing can be shaded. We continue to quote as a basis: No. 27 Black Sheets out of stock, 3.05c.; No. 14 Blue Annealed in car lots at the mills, 2.20c.; No. 27, One Pass Cold Rolled, in car lots at the mills, 2.75c.; No. 27 Galvanized Sheets out of stock, 4c. The structural situation is steady but dull, with a little specification against contracts. The prices hold at 1.60c. from the mill and 2.15c. out of stock. Plates have improved but little, almost anything desirable in delivery being possible. The price holds at 1.60c. at the mill. There is a little inquiry for Rails for electric line projects, with the understanding that contracts will not be closed until the projects have been financed, about which some difficulty is being experienced.

Old Material.—The Scrap trade is still dull, and transactions are confined to car lots. We continue to quote, all gross tons: Heavy Melting Steel, \$17.50; Old Steel Rails, \$18.50; Old Iron Rails, \$22; Old Car Wheels, \$19; Railroad Malleable, \$17; Cast Borings, \$8.50. All net tons: No. 1 Railroad Wrought, \$16.50; No. 1 Busheling, \$14.50; Wrought Turnings, \$12; Iron Car Axles, \$22.50; No. 1 Cast Scrap, \$14.50; Stove Plate, \$11.50.

Cincinnati.

FIFTH AND MAIN STS., September 2, 1903.—(By Telegraph.)

There has been quite a nice trade in Pig Iron throughout the past week. The general character of the orders is not materially changed, except that perhaps more of the tonnage is to cover wants until next January. Orders range from 50 to 1000 tons and cover all grades of Foundry stock, but few lots are for more than 500 tons. This Iron has been sold as low as \$11.50 for No. 2 Foundry, Birmingham basis, and ranging up to \$12 for some of the best grades, according to the buyer's fancy. The great majority of sellers say they have sold nothing below the \$11.75 basis, but a few acknowledge sales at \$11.50. One large buyer recently bought about 5000 tons, and his claim of having purchased on the \$11.50 basis is generally credited. There is but very little interest shown by buyers in the market for next year, and those who are talking trade for forward delivery are pounding vigorously at the price-list. Some are offering to contract on the basis of \$11 or \$10.50. Of course sellers will

not admit at this time that there is or will be any necessity for the recognition of a lower basis than the existing one. Nevertheless this recalcitrance on the buyers' part is having a rather weakening effect on the market. What little show of strength there was two weeks ago seems to be lost for the day, anyhow. Freight rates from the Hanging Rock district, \$1.15, and from Birmingham to Ohio River points, \$3.25. We quote, f.o.b. Cincinnati, for delivery throughout the year, as follows:

Southern Coke, No. 1.....	\$15.25 to \$15.75
Southern Coke, No. 2.....	14.75 to 15.25
Southern Coke, No. 3.....	14.25 to 14.75
Southern Coke, No. 4.....	13.75 to 14.25
Southern Coke, No. 1 Soft.....	15.25 to 15.75
Southern Coke, No. 2 Soft.....	14.75 to 15.25
Southern Coke, Gray Forge.....	13.75 to 14.25
Southern Coke, Mottled.....	13.75 to 14.25
Ohio Silvery, No. 1.....	20.15 to 21.15
Lake Superior Coke, No. 1.....	16.65 to 17.15
Lake Superior Coke, No. 2.....	16.15 to 16.65
Lake Superior Coke, No. 3.....	15.65 to 16.15

Car Wheel and Malleable Irons.

Standard Southern Car Wheel.....	\$25.75 to \$26.25
Lake Superior Car Wheel and Malleable	23.00 to 23.50

Pittsburgh.

PARK BUILDING, September 2, 1903.—(By Telegraph.)

Pig Iron.—There is nothing of interest to note in the Pig Iron market this week. Not enough metal is changing hands to establish a market, as no large consumers are inquiring for Iron. In fact, shipments of Bessemer Iron have been shut off to a number of leading Steel plants, that have shut down for repairs and other causes. The little business that is doing in Bessemer Iron is mostly by dealers, who quote about \$16.50 at Valley furnace, equal to \$17.35. Pittsburgh. It is doubtful, however, if 20,000 tons of Iron could be picked up at this price, as most of the furnaces quote \$17 at furnace, or higher. It is not unlikely that quite a number of blast furnaces in the Pittsburgh and Valley districts will close down before long unless the demand for Iron soon picks up. Northern Gray Forge is held at \$15.50, Pittsburgh, but there is practically nothing doing. Northern No. 2 Foundry Iron is offered at \$15.50 to \$15.75, Pittsburgh, but tonnage is mostly for carload lots. Foundries in the Pittsburgh district are well covered and will not be active buyers of Iron for several months. Very little, if any, Southern Iron is coming into this market.

Steel.—The output of Steel within the past week or two has been very materially restricted by the shutting down of a number of leading plants for repairs and other causes. Among these are the Duquesne Steel Works, Clairton Steel Company, Mingo Junction, Sharon and South Sharon plants. There is very little inquiry for Steel, and only small lots are changing hands at full pool prices. We quote Bessemer Billets at \$27; Open Hearth, \$28, Pittsburgh, Youngstown or Wheeling delivery. Sheet Bars take \$1 a ton advance.

(By Mail.)

Within the past week a distinctly better feeling has developed in the Iron trade, and inquiries have picked up a good deal, and the amount of tonnage being placed is larger than for some weeks. Confidence seems to be slowly returning, and this is really all that is needed to put the Iron trade on a good basis again. Crop reports are very good, and indications are that the West and South will be heavy buyers of manufactured products after the crops have been moved. Wire Nails and Wire have improved in demand considerably. At this writing the independent Sheet mills that sign the Amalgamated scale are in session in the Hotel Lincoln in this city, and will present resolutions to the Amalgamated Association, asking that the limit on output, which now prevails in union Sheet mills, be removed. There is no limit of output in nonunion Sheet mills, and it is claimed the leading interest has a material advantage over the independent mills in this respect. It is anticipated that the Amalgamated Association will grant this request of the outside mills, and also that all nonunion Sheet mills will be declared open, which would allow members of the Amalgamated Association to work in these mills and retain their membership in good standing. Labor troubles still keep up in the Pittsburgh district, and the plumbers have asked for an advance of from \$4 to \$4.50 per day, which will likely be refused. The amount of Pig Iron and Steel that is moving is relatively small, but there is a fair amount of inquiry, and the impression is growing that prices have probably reached bottom. Consumers continue to buy from hand to mouth for actual needs, not having enough confidence in the market as yet to place contracts. Prices of Steel are being firmly held, and some of the outside open hearth plants are

able to get a little better than pool prices. In Finished Iron and Steel there is nothing of importance to note, demand showing improvement and the tone of the market is generally firm. The whole situation looks much better than at any time since July 1, and it is believed that before September is over we will have a good demand for all kinds of Iron and Steel products.

Ferromanganese.—There is very little inquiry, and we do not hear of any important sales. We quote domestic and English Ferro at \$50, delivered, for 50-ton lots and over, but it is probable this price would be shaded on a firm offer and for large tonnage.

Muck Bar.—The nominal price of domestic Muck Bar is \$29.50, Pittsburgh, but on a firm offer this price would likely be shaded. Eastern Bar is being freely offered in this market at \$28.50 to \$29, delivered.

Hoops and Bands.—While the cotton crop will be from three to four weeks late this year, careful estimates put it at 11,000,000 to 12,000,000 bales, which is nearly 500,000 bales larger than last year. This would indicate a heavy demand for Cotton Ties when the season opens. As noted last week, the three large concerns rolling Hoops, Bands and Cotton Ties have reaffirmed prices on the old basis, and report an improved demand for these products. We quote: Cotton Ties, 87c. in 10,000-bundle lots or over; 92c. for carloads; Steel Hoops, 1.90c. in 250-ton lots and 2c. for carloads; Bessemer Bands, 1.60c. to 1.70c. for Open Hearth. Extras as per Steel card.

Plates.—There is some improvement in demand for Plates, but as a rule consumers are afraid to contract, fearing there may be a drop in prices. This hardly seems likely, however, as the Plate trade is so thoroughly controlled by the mills in the agreement. The Steel car companies report an increased demand for Steel cars, and this will soon be felt in the Plate trade. Some of the larger Plate mills have from four to six weeks' work ahead, and the situation is fairly satisfactory. Prices continue firm, but without change, and we quote: Tank Plate, 1/4-inch thick and up to 100 inches in width, 1.60c., at mill, Pittsburgh; Flange and Boiler Steel, 1.70c.; Marine, Ordinary Fire Box, American Boiler Manufacturers' Association specifications, 1.80c.; Still Bottom Steel, 1.90c.; Locomotive Fire Box, not less than 2.10c., and it ranges in price up to 3c. Plates more than 100 inches wide, 5c. extra per 100 lbs. Plates 3-16 inch in thickness, \$2 extra; gauges Nos. 7 and 8, \$3 extra; No. 9, \$5 extra. These quotations are based on carload lots, with 5c. extra for less than carload lots; terms net cash in 30 days.

Rails.—No large contracts have been placed since our last report. Some of the roads are negotiating for next year's tonnage, but have not yet placed their contracts. We quote \$28, at mill, for Standard Sections, for 500-ton lots and over.

Spelter.—There is a fairly active demand for Spelter and prices are firm. We quote prime Western grades at 5.65 1/2c. for future delivery and 5.70c. for spot delivery, f.o.b. Pittsburgh.

Sheets.—The action of the Amalgamated Association on the request of the outside union Sheet mills that the limit of output be removed is awaited with much interest and will have an important bearing on the Sheet trade. It is generally expected the request will be granted and that the nonunion mills will be thrown open. Demand for Sheets is fairly active, but there is still some hesitancy on the part of the consumers to place contracts, fearing that present prices will not hold. Quite a number of Sheet mills are idle, mostly the union mills of the leading interest, and this is centralizing operations among the nonunion mills. We quote No. 27 Black Sheets, Box Annealed, One Pass Through Cold Rolls, at 2.55c. to 2.60c., and No. 28 at 2.65c. to 2.70c., f.o.b., at mill. It is possible that on a nice specification and large tonnage some mills might shade these prices. Jobbers charge the usual advances over the above prices on small lots from store.

Tin Plate.—The fruit season is very late this year, and the prospects are not as encouraging as they might be. A fair amount of new orders are being placed for Tin Plate, and we continue to quote at \$3.80, Pittsburgh, for 100-lb. Coke Plates. For early delivery some of the outside Tin Plate mills are able to get 5c. to 10c. per box advance over the above price.

Rods.—There is some inquiry for Rods, particularly for Chain making purposes. We quote Bessemer Rods at \$35 and Open Hearth at \$35.50 to \$36, Pittsburgh. Chain Rods made of special stock are held at \$37.50, Pittsburgh.

Iron and Steel Bars.—The situation in Bars is somewhat peculiar at the present time. Prices of Iron Bars for delivery in the Pittsburgh district are being held up fairly well to the basis of about 1.65c., owing to the fact that outside mills are at a disadvantage in freight rates on Bars for delivery in this district. We understand that Eastern mills are selling Iron Bars as low as 1.50c., at mill, and

competition is very keen. The leading consumer has not as yet closed its contract for Steel Bars, but it is expected to do so within the next week or two. Demand is only fair, consumers being afraid to contract for fear prices may not hold. Should Iron Bars continue to decline, it may be necessary to adjust prices of Steel Bars to meet this unusual condition. We quote Iron Bars at 1.65c. for Pittsburgh delivery, but for delivery at other points they are being sold somewhat lower. We quote Steel Bars at 1.60c., Pittsburgh, in carloads and larger lots. For quantities less than 2000 lbs., but not less than 1000 lbs., \$2 a ton additional is charged, and less than 1000 lbs., \$6 additional.

Structural Material.—No large contracts have recently been placed in this district. However, a very large amount of work is being figured on by the different bridge companies, but much of it will hardly be placed before next year. Tonnage placed in August compares very favorably with the same month last year. With labor troubles in New York City and elsewhere adjusted, the situation will be helped very materially. We quote: Beams and Channels, up to 15-inch, 1.60c.; over 15-inch, 1.70c.; Angles, 3 x 2 up to 6 x 6, 1.60c.; Zees, 1.60c.; Tees, 1.60c.; Steel Bars, 1.60c., half extras, at mill; Universal and Sheared Plates, 1.60c.

Merchant Steel.—Tonnage is picking up considerably, quite a number of the smaller Implement makers having placed some fair sized contracts recently. Demand for Spring and Tire Steel is better than for some time. We quote: Open Hearth Spring, 2.30c. to 2.40c., base; Toe Calk, 2.25c., base, half extras; Tire Steel, 1.80c. to 2c. for usual sizes; Plow Slabs, Bessemer, 2.25c.; Open Hearth, 2.50c.; Tool Steel, 6½c., base, and upwards; Shafting, 42 per cent. off in less than carloads and 47 per cent. in carloads, delivered in base territory.

Skelp.—The market continues quiet and there is very little inquiry. We quote Grooved Iron and Steel Skelp at 1.80c. to 1.82½c., and Sheared at 1.87½c. to 1.90c., f.o.b. Pittsburgh, terms four months or 2 per cent. off for cash.

Pipes and Tubes.—The Tube trade continues very active, especially on the larger sizes, on which the mills are filled up practically for the balance of the year. On the smaller sizes of Merchant Pipe, such as go into buildings, demand has fallen off materially, due to labor strikes in the large cities which have restricted consumption very much. An inquiry is reported to be in the market for 80 to 90 miles of 12-inch Pipe, but the mills are so well filled up that it will be impossible to furnish this Pipe this year. Prices are firm, discounts to consumers in carloads being as follows:

	Steel.		Wrought Iron.	
	Black.	Galv.	Black.	Galv.
	Per cent.	Per cent.	Per cent.	Per cent.
1/8, 1/4 and 3/8 inch.....	68	58	65	55
1/2 inch.....	70	60	67	57
3/4 to 6 inches.....	75	65	72	62
7 to 12 inches.....	69	59	66	56

Merchant Boiler Tubes.

	Steel.	Iron.
1 to 1½ inches.....	42½	39
1½ to 2½ inches.....	55½	38
2½ to 5 inches.....	61	48
6 to 13 inches.....	55½	38

The outside mills rolling Iron Pipe are naming lower discounts than are given above.

Iron and Steel Scrap.—The Scrap market continues very dull, and prices are inclined to weakness. Early this year leading consumers of Scrap bought heavily, and now that the demand for Finished Iron and Steel has fallen off a number of mills are operating only part time, or else are closed altogether. This has restricted the consumption of Scrap, and dealers report that it is difficult to get specifications on contracts. We quote Heavy Melting Stock at \$18 to \$18.50 in gross tons, but occasionally odd lots are being offered at lower figures. No. 1 Wrought Scrap is \$15 in net tons, and No. 1 Cast Scrap, \$16 to \$16.50, gross tons; Car Wheels are \$20 to \$20.50, gross tons, and Wrought Turnings, \$12, net tons; Cast Iron Borings are \$9, gross tons; No. 1 Busheling Scrap, \$14.50, net tons, and No. 2, \$12.50, net tons; Steel Rails for rerolling are \$18 to \$18.50, gross tons; Iron Axles, \$26, gross tons, and Steel Axles, \$23, gross tons. We note a sale of 1000 tons of rerolling Rails at \$18 in gross tons, 1000 tons of Wrought Scrap at \$15 in net tons; 600 tons of Cast Scrap, \$16.25, gross tons; 600 tons of Wrought Turnings, \$12, net tons; 1000 tons of No. 1 Busheling Scrap for September and October delivery at \$14.50, net tons; also 200 tons of No. 2 Busheling Scrap, \$12.50, net tons. All the above prices are f.o.b. Pittsburgh.

Coke.—The shutting down of a number of Coke ovens and the running of the larger plants only five days a week has cut down output very much, and in this respect the Coke trade is showing a betterment. Connellsville Furnace Coke for prompt shipment is still offered at \$2 to \$2.25 a ton, and 72-hour Foundry at \$2.75 to \$3 a ton at oven. The output in the Upper and Lower Connellsville region last week was about 295,000 tons, a slight decrease over the previous week. Shipments were 11,938 cars, a gain over the previous week of 1617 cars. It is predicted the Coke trade will soon show material improvement, as a shortage of cars

is not improbable, but in fact is already reported in some sections of the country.

Floyd K. Smith, Pittsburgh, representative of the Republic Iron & Steel Company, has resigned his position to connect himself with Banning, Cooper & Co., Iron and steel factors, Lewis Block, Pittsburgh, Pa. The many friends of Mr. Smith will extend to him their best wishes for abundant success in his new connection. He has been succeeded by E. L. Claypool.

St. Louis.

CHEMICAL BUILDING, September 2, 1903.—(By Telegraph.)

Pig Iron.—Buyers have shown fair activity the past week, and orders, while generally for limited requirements, have been booked in some volume. Looks like the present basis for No. 2 Foundry Iron would be the point to buy, and as soon as the great majority of our consumers are convinced that lower figures are not likely, covering on a big scale for future wants is bound to come about. We quote, f.o.b. St. Louis, as follows:

Southern, No. 1 Foundry.....	\$16.25 to \$16.50
Southern, No. 2 Foundry.....	15.75 to 16.00
Southern, No. 3 Foundry.....	15.25 to 15.50
Southern, No. 4 Foundry.....	14.75 to 15.00
No. 1 Soft.....	16.25 to 16.50
No. 2 Soft.....	15.25 to 15.50
Gray Forge.....	14.75 to 15.00
Southern Car Wheel.....	26.75 to 27.00
Malleable Bessemer.....	19.25 to 19.75
Ohio Silvery, 8 per cent. Silicon.....	23.00 to 23.50
Ohio Strong Softeners, No. 1.....	19.25 to 19.75
Ohio Strong Softeners, No. 2.....	18.75 to 19.25

Bars.—Store trade among jobbers continues quite active and prices are maintained. Jobbers quote for both Iron and Steel, 12.15c. to 2.25c., according to quantity.

Rails and Track Supplies.—The demand for supplies in this department has ruled very good the past week and considerable new business is pending. We quote as follows: Splice Bars, 2.05c. to 2.15c.; Bolts, with Hexagon Nuts, 3.05c. to 3.15c.; with Square Nuts, 2.90c. to 3c.; Spikes, 2.15c. to 2.25c.

Angles and Channels.—Jobbing conditions in these lines seem to point to a better volume of trade and prices are unchanged. From store 2.25c. to 2.40c. for material of this class.

Pig Lead.—Moderate activity and a generally firm state of affairs is the report in the Lead market. Sales have been made at 4.20c., and as high as 4.25c. is said to be bid for Missouri brands.

Spelter.—The market shows continued strength, and Spelter for prompt shipment is said to readily command 5.60c. to 5.65c., and offerings are limited.

Birmingham.

BIRMINGHAM, ALA., August 31, 1903.

There has been during the past week an increased demand for Iron. While one can hardly say it is very general, he can say with verity it is of quite respectable proportions and is growing. In some cases the sales have run from 1000 to 5000 tons, but the bulk of the buyers are keeping close to shore and buying in moderate and small amounts. There was on the market at the close of the week one inquiry for 10,000 tons for delivery covering the balance of the year, but it has not been closed and probably won't be now. The buyer has his ideas as to price somewhat under current quotations, and sellers are not as a rule disposed to slaughter values. At present values holders will take the chances of an even, steady market, and price cutting will be very limited.

While the price established was on the basis of \$11.50 for No. 3 Foundry, a leeway of 25c. was given to be used when necessary to meet competition, making in such cases \$11.75 the price. Competition developed speedily, for the inside price was quickly adopted and a very fair portion of the business done has been on this basis. Just what part of it cannot be stated, as those doing the cutting are averse to advertising the act. There is in some quarters a feeling that prices will further decline, but it is a case where the wish is father to the thought. A material reduction from prevailing prices would put some furnaces out of commission, while to others profits would be pared to nil, and very few would show any profit at all. The prevailing disposition is not to anticipate the bridge, but to wait until you get to it before you cross it. The larger interests seem to have the greater faith in a continuance of the improvement that has already come.

Some further relief for the furnace interests is anticipated when the Southern Tariff Association meets here on Friday of this week. It will consider and act upon the petition to make a reduction of 50c. per ton on Iron shipments from Southern points where it can be shown that this is necessary to meet competition. There has nothing so far developed to indicate what this action will be. If favorably

considered it would be only the re-establishment of the rate that prevailed anterior to the advance of Iron above \$12.

In the sales that have been made there has been a pretty general distribution among the various grades, and the desire for prompt shipment on spot takings still exists.

The new contracts made necessary by the awards of the Court of Arbitration have been generally signed. At a very few points, and principally in Walker County, there was a little friction in putting the new scale and rules in force, but it was quickly overcome, and now everything is practically working under the new order of things. The order of United Mine Workers are invading contiguous territory where they are weak, and have organized a few locals. It is a question of only a comparatively short time when the order will dominate wherever in Alabama coal is mined. They never miss the opportunity to add to their strength and are always alert and active.

The United States Court, in the matter of the Southern Car & Foundry Company, has directed that all its property be turned over to the receivers, who are instructed to take possession of the plants. It is current gossip that there is a fair probability now of a settlement of their affairs and their reversion to interests able to finance them and successfully conduct them.

A new industry has been secured in the district, to be located at Bessemer—i.e., a drop forge and castings plant. The parties in active management of affairs are local.

The Lucile Coal Company, who have been in court because of contending interests, have had their difficulties settled and have been turned over to the owners, who have reorganized their affairs and will mine Coal.

There are some properties in negotiation which are depending for successful outcome upon the financial market. Some of them are promising properties.

There is still activity in all of our industrial interests. The various shops report very satisfactory bookings and there is nothing in sight to discourage an optimistic view of the future. Some plans are being discussed for the building of more sky scrapers, but the present supply looks as though it will be equal for some time to come to our needs.

There is as yet no trouble in making prompt shipments, but a note of warning is sounded again for the near future. We are near the time when any kind of a car will be gladly accepted by the shipper.

Trade Publications.

"Concerning Iron Making."—Fisk & Robinson of New York and Boston have just issued a second edition of the pamphlet, "Concerning Iron Making," by Elisha Walker. It contains several new illustrations which show the progress made on the plant of the Buffalo & Susquehanna Iron Company to date. The work has now reached such a stage that the blowing engines, electric generators, pumps and boilers are being installed. The work on the ship canal between the property of the company and that of the Pennsylvania Railroad Company is being carried forward rapidly by the contractors. The development of the company's iron ore mines at Hibbing, Minn., and at Iron Mountain, Mich., and of their coal fields at Sykesville, Pa., is advancing at the same favorable rate as is the work on the blast furnace itself. The Iron Mountain mine is already shipping ore. As the plant at Buffalo is not yet completed, the output of this mine is being sold on the market.

Milling Machine.—The Waltham Watch Tool Company of Springfield, Mass., have issued an eight-page folder illustrating and otherwise bringing out the features of the No. 2 Van Norman duplex milling machine. A feature of the folder is a series of 16 engravings showing as many operations, a series which is the more interesting as this machine differs from other styles of milling machines in the arrangement of the cutter head, which is adapted to be moved and operated at any angle from vertical to horizontal, and in its ram, or frame on which the head is mounted, which has an adjustment in and out over the column. These combined adjustments of the cutter head and ram permit the operation of the cutter in the most advantageous position relative to the nature of the work in hand. The change from one position to another of the cutter head or ram can be made in a moment, and, what is esteemed as especially important, the cut at any angle can be carried through the full longitudinal movement of the table. The machine combines the advantages of the horizontal and vertical types of milling machines with the added features of the movement of the ram. Another feature is the interior sliding spindle for drilling and counterboring at any angle. The spindle can be quickly adjusted and has a sliding movement inside the main spindle with a hand feed of 3 inches. Yet another point is the profile stud for the cutting of cams and other irregular forms from a pattern.

Ryland's Atlas.—A useful guide to the collieries, iron, steel and tin plate works and iron ore mines of Great Britain, together with their position on railroad or canal, has just been published by the *Iron Trade Circular* (Ryland's) of 41 and 42 Exchange Buildings, Stevenson place, Birmingham, England. This atlas contains 86 maps on the inch scale of the collieries, iron works, steel works, blast furnaces, tin plate works, iron ore mines and oil shale mines of England, Scotland and Wales. It is claimed to be the first complete set of maps published on the subject. The size—1 inch to a mile—with few exceptions, leaves ample room for additions. It is proposed in 1904 to issue a corrected key which will include some new collieries. With the atlas is published a key giving full particu-

lars of the references on the various maps. The value of this atlas to Americans is that it shows at a glance the exact position with facilities for transportation of every iron works which may from time to time be in competition with America.

"Thirty Years of Springs" is the title of a small pamphlet by William Metcalf, president of the Braeburn Steel Company, Pittsburgh. Thirty years ago bolster springs were made mostly of gum, gum and coils of steel around them, and gum in boxes of great variety. For elliptical springs there were flat, concave, ribbed and corrugated. The gradual introduction of open hearth and Bessemer steels promptly drove out the gum, and slowly but inevitably also drove out the crucible steel. The first spring steel specification was drawn by the president of this company. He ignored the mode of manufacture and devoted himself to getting the best material consistent with reasonable cost of manufacture. The result was the famous and almost universally accepted Pennsylvania Railroad specifications for spring steel. Following this there came from the mechanical department of the same railroad the first reasonable and sensible specification for coiled springs. A circular section (the round bar) was adopted for all coils, because the strain was torsional and the round section gave the maximum resistance to torsion.

Water Purification for cities by the sulphate of iron process is described in a very neat pamphlet by the American Steel & Wire Company. Sulphate of iron is one of the chemical products of this company, and in order to demonstrate its particular use in the purification of water, tests were made at the water works system of Quincy, Ill. The result of the test is most favorable to the employment of sulphate of iron in the treatment of water for both domestic and commercial uses. The manner of introducing the sulphate of iron, and also another solution which is requisite—lime—is as follows: The sulphate of iron is dissolved in a tank, the lime being dissolved in two tanks, sufficient water being used to exhaust the CaO and produce a clear solution. The river water is charged with the necessary quantity of sulphate of iron solution while being pumped from the intake well, but the lime solution is not injected until after the water has passed the pumps. Charged with both solutions, the water then passes into the sedimentation tank of the basin. Here the solutions quickly draw from the water by precipitation and coagulation the animal, vegetable and foreign matter, leaving only a small percentage to be extracted by filtration.

Small Motors.—An unusually handsome catalogue by the General Electric Company deals with the line of small motors which they have perfected. Complete lines of belted motors for use with the different varieties of both direct and alternating current are manufactured by the company and kept in stock at their factories and agencies. All these machines are particularly designed to withstand the wear and tear of constant operation and hard usage. They are neat and symmetrical in outline and sturdy in design. Their automatic belt tightener, which is illustrated with motors alone and with motors applied to various purposes, consists of a special pulley end head provided with two carriages, one of which carries by means of a stud and rocker arm an idler pulley, and the other a spring supported rod made fast to the rocker arm. The latter carriage may be bolted at any angular position around the shaft by means of a T-headed lock bolt, working in a suitable channel in the motor head concentric with the shaft. The carriage carrying the idler pulley is arranged to work freely around the slot and can be clamped in any angular position around the driving pulley. By the use of this device motors with small driving pulleys can often be used for operating machinery at a speed so low that without a belt tightener the problem would be much more complicated.

Pipe and Bolt Threading Machines.—A comprehensive catalogue has been prepared by the Oster Mfg. Company of Cleveland, Ohio, describing their tools and machinery for threading pipe and bolts. Their stocks and dies are adjustable to variations in size of pipe and fittings, and are operated by convenient cam movements, easily released from the work without running back from a finished thread. Their patented fulcrum clamp is positive and guaranteed to hold the dies in place. It is set and released by a thumb screw. The dies are removed by a very simple movement, there being no screws to take out. They may be sharpened by grinding on the flat side of an ordinary grindstone. The dies and guides are self centering, and the guides adjust to all sizes within the range of the tool, thus doing away with numerous bushings and materially reducing the weight of the tool. By use of these guides a perfect center of the work in the dies is assured. The cutting off blade is a lathe tool fed by a thumb screw and cannot get out of order.

Flour Mills, Elevators, Power Plants, &c.—A catalogue of 450 pages is sent out by the Great Western Mfg. Company of Leavenworth, Kan., describing their flour mills, elevators, power plants, mining machinery, cement and plaster mills, saw mills, and so on. This company are prepared to equip in every detail any of the works just mentioned.

Late bulletins, or circulars are just issued by the Westinghouse Electric & Mfg. Company of Pittsburgh, Pa., describing their rotary converters, air blast transformers, direct heating railway generators, direct current engine type generators and engine type alternators.

A brief history and description of the art of steel casting has been prepared by the National Steel Foundry Company of New Haven, Conn. The pamphlet is handsomely illustrated and the text clear and concise.

A pamphlet by Baeder, Adamson & Co. of Philadelphia, Pa., describes their improved methods of insulation, by using hairfelt, for cold storage and other industries employing refrigeration.

The New York Machinery Market.

NEW YORK, September 2, 1903.

Immediate business is still very dull, but the outlook for good fall trade continues to improve. Certain machinery merchants state that the month of August of this year was the poorest month experienced in some time, in fact, some went as far as to say the last few years. This applies to orders. Inquiries were received in such volume as to maintain a good tone and cause the merchants to expect better things soon.

The large deals which have attracted attention for some weeks, and in certain instances months, are still held in abeyance, but they seem to retain their life sufficiently to lead the trade to anticipate their consummation constantly.

Some new projects have come to light, among which the most notable, and really the only ones which have assumed definite proportions, are the Louisville & Nashville car shops and the New York Central electrification scheme. In a general way the latter is of course as old as many of the other big affairs that have commanded attention of late. From the viewpoint of specific indication of a determination to proceed with the work, however, the present phase of the project is new. Specifications for the equipment of the power stations are out. There are to be two electric power stations. One will be located at the New York terminal of the system at Port Morris, and the other at a point not definitely decided upon, several miles up the Hudson River. The question of means of generating the power is now up for decision. We understand that the larger steam turbine and reciprocating engine builders have been invited to bid. According to present plans each of the stations is to hold from three to six 5000 kw. units. The specifications call for bids on six units of this size and six additional units, price to be named for six and each additional unit. Bids for all of the other equipment are asked for on the same principle. There are three sets of specifications for the boilers. One calls for tenders on from 24 to 48 water tube boilers of 800 horse-power each; bids to be submitted on the first 24 units in total and price for each additional unit of 800 horse-power. The second proposition calls for from 32 to 64 water tube boilers of 625 horse-power each; bids to name price for first 32 units and each additional unit.

The third class of proposals is to be based on from 48 to 96 water tube boilers of 500 horse-power each, bids to name price of first 48 and each additional unit. All of the boilers are to be equipped for superheating and with automatic stokers. The three propositions, we understand, have been arranged so that one may be adopted to coincide with whatever selection is made as to generating units. For instance, if a certain type of steam turbine, say the Curtis, is decided upon, one arrangement of the boilers will be taken, while the adoption of the Westinghouse turbine will call for a different boiler system. The reciprocating engine will require still another arrangement of boilers. The difference in steam pressure is also dependent upon the decision as to engine or turbine.

That the engineers in charge of the work are desirous of saving as much time as possible is evinced by the procedure of obtaining bids on the various boiler lay outs, instead of waiting until a decision has been arrived at as to whether turbine or engine will be employed. The boiler bids are called for September 8. Bids on all of the other apparatus are expected about this time, although the outside limit has been placed at September 15. E. B. Katte is the secretary of the advisory board in charge of the work. The other members of this board are Messrs. Arnold, Gibbs, Wilgus, Deems and Gregory.

In the machine tool trade nothing of unusual interest has transpired. The big General Electric deal is still undecided upon, the Shop Committee having put the placing of orders off for a week or so. The several large railroad purchases have also remained unsettled. The New York Central are said to have a large number of machine tool requisitions coming through.

Work on the extensive new shops of the International Steam Pump Company, at Harrison, N. J., is progressing very rapidly. The steel structures of the great buildings are almost completed. An official of the company stated to a representative of *The Iron Age* that there is no likelihood of the company's issuing a big list of machine tools to be purchased for the equipment of these shops. He said that for some time past the company have been quietly accumulating the machines which are to be operated in the new plant. They have been placed in the Worthington shops, at Brooklyn, and put into operation immediately. In this way, he said, the men can become accustomed to using the machines, so that when they are placed in the new plant everything will start off smoothly at once. Superintendent Schwanhauser, he said, is laying out a plant for the equipment of the new shops, and, having plenty of room, will be able to get much more out of the new tools than they are producing now. After these tools are installed and running and Mr. Schwanhauser has had an opportunity to ascertain just how much he can do with the present equipment, addi-

tional machinery will be purchased if required. It is not probable, however, he said, that the great quantity that is generally expected in the trade will be needed.

Work has been commenced on the construction of the new car and repair shops of the Louisville & Nashville Railroad Company at South Louisville, Ky. W. H. Courtenay, principal assistant engineer, whose headquarters are at Louisville, Ky., has assumed charge of the work, and has given out details of the plans. The buildings will occupy an area of about 25 acres, and are arranged in a triangle. Across the broad end of the triangle run the tracks of the Southern Railway. The main line of the Louisville & Nashville runs along the west side. At the most southern point switches run out diagonally into the yards about the various buildings. Each building is to have a separate switch from the main line. The various buildings and machinery will cost over \$2,000,000. It is expected to have the shops completed by June, 1904. The buildings and their size, as shown by the completed plans, are as follows:

The iron foundry, 90 x 443 feet. In this building it is expected to make all the castings which are needed in passenger or freight car or locomotive building. The wheel shop, the storehouse for freight car material and the pipe shop are combined in one big building, 90 x 202 feet. The road expects to make and repair its own wheels, and also to manufacture all the piping used on both cars and locomotives. The storehouse for iron is to be 150 x 151 feet in size. The smith shop is to be 150 x 402 feet in size. The oil storage warehouse is 40 x 81 feet in size, and will be used not only for the storage of oils used in the shops, but also for oil used on this division of the road. The erecting shop is to be 171 x 218 feet, and will be used for building passenger cars. The freight car repair shop is to be 145 x 400 feet in size, and will be large enough to repair all the freight cars owned by the road, should the occasion arise. The boiler shop is to be 78 x 140 feet in size, and will be used for both manufacturing and repairing boilers. The freight car building shop, one of the largest, is to be 140 x 300 feet in size. The planing mill, 180 x 202 feet in size, will convert raw lumber into that suitable for use for building cars. The passenger truck shop, 50 x 100 feet, will be used in manufacturing trucks for all cars used. The upholstering shop, 50 x 60 feet, will be devoted to upholstering the seats in passenger coaches. The coach shop, 180 x 482 feet, is to be used for repairing old passenger coaches and finishing new ones. The storehouse, 108 x 200 feet, will be used for the storage of all kinds of material. The new freight car house, 134 x 300 feet, will be used for putting the finishing touches on freight cars. The lumber kiln, 80 x 80 feet, will be used for artificially seasoning lumber needed. In addition to these buildings there will be an immense lumber yard. With these buildings the officers of the road expect to be able to turn out all the rolling stock needed on the entire system.

The following bids were opened August 25 at the Bureau of Supplies and Accounts, Navy Department, Washington, for supplies for the Eastern yards:

- Bidder 1. Browning Engineering Company, Cleveland, Ohio.
2. Cutler, Wood & Stevens Company, 68 Pearl street, Boston, Mass.
3. Manhattan Supply Company, 127 Franklin street, New York City.
4. American Hoist & Derrick Company, 63 S. Roberts street, St. Paul, Minn.
5. Springfield Machine Tool Company, Springfield, Ohio.
7. Garvin Machine Company, Spring and Varick streets, New York City.
8. Holtzer-Cabot Electric Company, Brookline, Mass.
9. Hyde Windlass Company, Washington and Federal streets, Bath, Me.
10. Hill, Clarke & Co., 156 Oliver street, Boston, Mass.
11. Thompson Electric Company, 346 Wabash avenue, Chicago, Ill.
12. American Tool Works Company 613 Eggleston avenue, Cincinnati, Ohio.
13. Hendey Machine Company, Summer street, Torrington, Conn.
14. General Electric Company, Schenectady, N. Y.
15. S. A. Woods Machine Company, Daw street, South Boston, Mass.
16. Prentiss Tool & Supply Company, 115 Liberty street, New York City.
18. Drew Machinery Agency, Manchester, N. H.
19. Fox Machine Company, North Front and Fourth streets, Grand Rapids, Mich.
20. Manning, Maxwell & Moore, 85 Liberty street, New York City.
21. American Ship Windlass Company, Providence, R. I.
22. Frank W. McNeal, 29 Beekman street, New York City.
24. Brown Hoisting Machinery Company, Incorporated, 26 Cortlandt street, New York City.
25. Montgomery & Co., 105 Fulton street, New York City.
26. Westinghouse Electric & Mfg. Company, Pittsburgh, Pa.

27. Northern Electrical Mfg. Company, 29 Bowery, New York City.

28. Niles-Bement-Pond Company, 136 Liberty street, New York City.

29. Crocker-Wheeler Company, Ampere, N. J.

30. Industrial Works, Bay City, Mich.

Class 7. Three direct current buffing motors.—Bidder 11, \$580.

Class 8. Two 3 horse-power electric motors.—Bidder 11, \$380; 14, \$440; 8, \$466; 29, \$516; 26, \$520.

Class 9. One improved vertical friction drill.—Bidder 10, \$200.

Class 10. One screw cutting engine lathe.—Bidder 10, \$644.90; 13, \$650.

Class 11. One electric motor tool grinder.—Bidder 10, \$99; 11, \$209.50.

Class 12. One direct electric driven engine lathe.—Bidder 12, \$2675; 28, \$2800 and \$3975; 7, \$2885; 20, \$3000; 16, \$3219; 5, \$3400.

Class 13. One anchor windlass.—Bidder 21, \$14,000; 9, \$14,600.

Class 14. One 36-inch band sawing machine.—Bidder 20, \$110 and \$179; 19, \$137; 16, \$148; 22, \$155; 15, \$225.

Class 15. One 10-ton steam locomotive crane.—Bidder 24, \$6160; 1, \$6800 and \$7800; 4, \$6945; 30, \$6950 and \$7200.

Class 16. One improved jointing and facing machine.—Bidder 15, \$433.54; 16, \$437.

Class 17. One improved quick acting jig or scroll saw.—Bidder 15, \$310.90; 16, \$313.

Class 18. One combined revolving mandrel frame saw bench.—Bidder 15, \$700.

Class 19. One band saw machine.—Bidder 16, \$479; 15, \$585.

Class 20. One 24-inch hollow spindle patternmaker's lathe.—Bidder 10, \$450; 16, \$524.

Class 21. One band saw filing machine.—Bidder 15, \$78.

Class 22. One circular saw filing machine.—No bids.

Class 23. One circular saw setting machine.—No bids.

Class 24. One miter and trimming machine.—Bidder 19, \$21; 10, \$35.50 and \$58; 20, \$40.

Class 25. One band saw brazer.—Bidder 19, \$12.

Class 26. One motor driven polishing and buffing machine.—Bidder 2, \$300; 3, \$324.40.

Class 27. One motor driven buffing and polishing lathe machine.—Bidder 2, \$300; 7, \$300; 3, \$324.40.

Class 28. One 20 horse-power electric motor.—Bidder 29, \$408; 18, \$444.50; 26, \$475; 14, \$481; 8, \$508; 27, \$545.

Among the naval supplies required for the Mare Island Navy Yard, bids for which will be opened September 15, are the following:

Class 38. One belt driven plate scarfing machine.

Class 39. One shearing, bending and punching machine.

Class 40. One engine driven angle bar beveling machine.

Class 41. One steel traveling tower and overhead tramway complete.

Milliken Bros., 11 Broadway, New York, have been awarded the contract for the iron work for the new buildings to be erected at Elizabethport, N. J., by the Singer Mfg. Company. Other than this, all the materials of construction are to be bought by the architect, David B. Provost of Elizabeth.

The New York Central have specifications out for two 600 kw. Corliss engines, to be installed at the West Albany shops. Nothing has been done as yet regarding machinery equipment for the new shops at this point.

The De Lamar Copper Refining Company, who are building a new central power station at their Carteret, N. J., plant, have awarded the contract for a central barometric condenser system to the Alberger Condenser Company of 95 Liberty street, New York. The boilers, which will be of about 3000 horse-power, have been purchased from the Babcock & Wilcox Company. The power station is to furnish electrical energy for a new electrolytic copper refining plant which the company have in course of construction.

The Canadian Copper Company of Sudbury, Ontario, have also placed an order with the Alberger Condenser Company for a 3000 horse-power central barometric condenser plant.

The Dundee Textile Company of Passaic, N. J., have purchased a 175 horse-power high speed Ball engine from Woolston & Brew of 39-41 Cortlandt street.

The contracts for the engines to be installed in the new power station of the Presbyterian Hospital, New York, were awarded to Woolston & Brew. They call for two Ball high speed units.

Charles A. Schieren & Co. have purchased the property, 61-65 Cliff street, adjoining their present plant at Cliff and Ferry streets, New York, where they will erect a six or seven story building early next spring. It is understood that a good part of the building will be used as an addition to their present plant for the manufacture of leather belting, and that considerable new equipment will be installed. No plans have yet been prepared, and nothing has been done in the way of mechanical equipment.

M. H. Treadwell & Co. of 95 Liberty street, New York, have opened a branch office in the Pennsylvania Building,

Fifteenth and Chestnut streets, Philadelphia. R. D. Granger, who was previously associated with the New York offices, is in charge.

The Plunger Elevator Company have just closed a contract through their New York sales agent, W. L. Lawton, with office at 17 Battery place, for ten elevators for the factory building of Eaton, Cole & Burnham Company of Bridgeport, Conn.

The New York office of the Plunger Elevator Company on September 1 moved from 156 Fifth avenue to Room No. 509, Whitehall Building, 17 Battery place.

New York.

NEW YORK, September 2, 1903.

Pig Iron.—While buyers generally are purchasing small lots only, the demand is so continuous that the daily tonnage runs up to a large aggregate. A few lots of 1000 tons have been sold, but this class of trading is only done with consumers who are covering sales of their own product. Inquiries are in the market for round lots, but no anxiety to close is shown. Leading producers of Foundry Pig Iron report their sales running up to their daily output. Quite a number of Northern furnaces, however, are cleaning up preparatory to blowing out, as there is no margin at present cost of production. We quote, at tidewater: No. 2 X Foundry, \$16.50 to \$17; No. 2 Plain Foundry, \$16 to \$16.50; Gray Forge, \$15.50 to \$16; Basic, \$16 to \$16.50. Tennessee and Alabama brands: \$16.75 to \$17 for No. 1, \$16.25 to \$16.75 for No. 2, and \$15.75 to \$16.25 for No. 3.

Steel Rails.—An inquiry for 20,000 tons from a Texas road is reported. A few small lots of Standard Sections have been sold, but they have not amounted to more than 2000 tons. Light Rails are weaker. We quote \$28 for Standard Rails and nominally \$32 to \$34 for Light Rails.

Cast Iron Pipe.—A good volume of business keeps coming up, consisting of moderate sized orders. Philadelphia is asking for bids on 1100 tons, and New York City purchases small quantities every few days. The general demand for small lots is also steady, the aggregate in this way footing up to a good daily total. Quotations on carload lots of 6 to 10 inch are \$32, and 12 inch upward \$31, gross ton, at tidewater. These prices are shaded on large quantities.

Finished Iron and Steel.—The Pennsylvania Steel Company have been awarded the contract for constructing a new Steel highway bridge across the Potomac River to take the place of the historic Long Bridge. Plans have been filed in this city for several office and hotel buildings of large size, which will take a heavy tonnage of Steel. The indications are that local building operations will be on a large scale as soon as the labor complications have been definitely settled. It had been expected that a settlement would be reached long before this, but annoying obstacles have intervened which, however, are gradually being overcome. The Plate trade is fair, orders being frequent, although calling for small quantities. The Bar trade shows a little more activity, but prices are still quite irregular. We quote, at tidewater, as follows: Beams, Channels and Zees, 1.75c. to 2c.; Angles, 1.75c. to 2c.; Tees, 1.80c. to 2c.; Bulb Angles and Deck Beams, 1.90c. to 2.25c. Sheared Steel Plates, in carload lots, are 1.78c. to 1.85c. for Tank, 2c. to 2.10c. for Flange, 2.10c. to 2.20c. for Marine and 2.25c. upward for Fire Box. Refined Bars are 1.60c. to 1.80c.; Soft Steel Bars, 1.70c. to 1.80c.

Old Material.—A leading trunk line several weeks since offered 9000 tons of Old Steel Rails for sale, but withdrew them from the market, having received bids which were not considered satisfactory. The same lot has been offered within the past week and again withdrawn for the same reason. Other railroads have offered good lists of Old Material and have failed to make any sales of consequence. Transactions are confined to one or two carloads, consumers being still disinclined to make purchases of any quantity. Collections are very slow. Quotations are nominal, but approximate figures are as follows per gross ton, New York and vicinity:

Old Iron Rails.....	\$18.00 to \$19.00
Old Steel Rails, long lengths.....	17.00 to 18.00
Old Steel Rails, short pieces.....	15.50 to 16.00
Relaying Rails, heavy sections.....	22.00 to 23.00
Old Car Wheels.....	16.00 to 17.00
Old Iron Car Axles.....	20.00 to 21.00
Old Steel Car Axles.....	18.50 to 19.00
Heavy Melting Scrap.....	15.50 to 16.00
No. 1 Railroad Wrought Iron.....	16.00 to 17.00
Iron Track Scrap.....	15.50 to 16.00
Wrought Pipe.....	11.00 to 11.50
Ordinary Light Iron.....	8.00 to 8.50
Cast Borings.....	6.00 to 7.00
Wrought Turnings.....	11.00 to 11.50
No. 1 Machinery Cast.....	15.00 to 15.50
Stove Plate.....	8.50 to 9.00

Grant & Williams, New York City, dealers in Scrap Iron, have failed, with liabilities reported amounting to \$100,000. They operated a yard at Newark, N. J.

The Chicago Machinery Market.

CHICAGO, ILL., August 31, 1903.

One of the most prominent and interesting features of the machinery industry of this section during the month of August has been the increased demand for small tools, largely for renewals, which are to be electrically driven. Another point of interest has been the demand for gas engines, usually of small capacity, but some orders for large units are in the market. The conditions underlying these developments are of importance to note. The prime motive, apparently, of change from steam to gas power, in a number of instances, is to escape from the exactions of and annoyances as well as financial loss arising from the demands of labor unions. In large measure the same motive may be attributed to the demand for electrically driven machinery, both gas and electricity being free from some of the objections of steam; but the economy of electrical installations has also been consulted, and, while it may not have been the original motive for change, it is probably a greater factor in new installations.

Manufacturers of electrical machinery note that while during June and July there was an active demand for large generators, the stock of small motors increased largely, but that during the latter part of July and the early part of August there was a radical change in that the stock of small motors had been much reduced, the demand being active for such machines, most of them going to small industries for installation upon tools which are to be independently driven.

The bulk of the orders for reciprocating engines received during the month seems to have been for small units, very few large contracts having been closed; but some business of this character is pending, such business being largely from the East.

Local dealers in machine tools note that there has been quite an improvement in the demand for small tools, especially for lathes, drill presses, milling machines, grinders, &c. There has also been an improvement in the demand for boiler makers' machinery, such as punches, rolls, &c., and small pneumatic tools for installation in structural steel plants. Railroads, also, have been freer buyers of machine tools, and have placed a number of contracts for elevating and power transmission machinery for isolated and independent plants along the lines of the roads. Among the larger railroad buyers of machine tools in this city have been the Northwestern, the Santa Fé, the Missouri Pacific and the Burlington, and nearly all of these roads are still in the market for various machinery equipment. The Denver & Rio Grande Railroad has issued its list for machine tools for next year since our last report, and dealers are now making estimates. There has been an especially active demand for second-hand equipment, especially small tools, and all offered has been taken with avidity, very fair prices being realized. In making installations some important trades have been made in Chicago during the last ten days in the exchange of old for new tools, and the old tools were readily disposed of on the market.

While there is no very large business in immediate prospect, aside from that of reciprocating engines above referred to, there is considerable business of various kinds which, in the aggregate, is larger than has been offered for three or four months.

There is a better demand for special machinery, such as used in cement plants, breweries and grain elevators. One large contract for cement machinery is about to be placed on the Pacific Coast. There is also an order for a gas engine of 1000 horse-power, which will be placed by a large Chicago company within a week or so.

Some important contracts for export to South Africa, Australia and Europe have been taken for engines and special machinery during the month, and inquiries for other machinery are more numerous.

New Construction and Equipment.

The American Steel Foundries and the Standard Forgings Company have adopted plans for their new plants at Indiana Harbor and are in the market for various kinds of machinery.

The Simplex Railway Appliance Company are putting in a new steel frame building at Hammond, Ind., preparing for the manufacture of coil and elliptic springs for all kinds of cars and locomotives. The new plant will be electrically driven.

The West Allis Malleable Iron & Chain Belt Company have recently increased their capital stock from \$100,000 to \$150,000, the additional funds to be expended in extending the plant and in largely increasing its capacity.

The Dobson Mfg. Company, Rockford, Ill., have completed plans for the construction of a new foundry, 70 x 180 feet.

The Racine Steel & Iron Mfg. Company, Racine, Wis., are completing additions to their plant and installing new machinery.

The machine tools which have been installed at the new shops of the Rock Island Railway Company at Moline, Ill., are to be electrically driven. The contracts for the generators and constant and variable speed motors have been placed at different times with the Crocker-Wheeler Company and the General Electric Company. The last purchase was made about a week ago from the Crocker-Wheeler Company, consisting of 30 motors, aggregating 400 horse-power. The entire contract for the electrical installation is estimated at \$40,000.

The Electrical Supply Company, Madison, Wis., have secured the contract for furnishing to the village of Sauk City, Wis., a complete electric lighting plant, including boiler, engine, dynamo, pole line and other accessories.

The United Iron Works Company, successors to the Sterling Iron Works, Springfield, Mo., have been awarded the contract for establishing an electric street lighting plant at Benton, Ill.

Power Transmission.

The Stephens-Adamson Mfg. Company, Aurora, Ill., have their capacity booked ahead for the next 90 days and report good inquiries from all classes of industry that handle commodities in bulk. They have been obliged to purchase some new machinery within the last two weeks, including a large planer. Among the contracts recently taken is the complete machinery equipment for the new grain elevator being built by the Missouri Pacific at Kansas City, and also the machinery equipment for an elevator being built by the Burlington at Kansas City.

The Aetna Foundry & Machine Company, Springfield, Ill., report business still very good, and the outlook for the remainder of the year very bright. They are extending their business somewhat, but do not intend to make any changes in their plant at present, except to install two 10-ton electric cranes, one purchased of the Case Mfg. Company, Columbus, Ohio, and the other of the Cleveland Crane & Car Company, Cleveland, Ohio.

The Industrial Works, Bay City, Mich., report business very satisfactory with them at present and about the same as at this time last year.

The Northern Engineering Works, Detroit, Mich., state that business during the past month has been fully as good as August of last year. They report the outlook very good.

Engines, Boilers, Pumps, &c.

The Allis-Chalmers Company, Chicago and Milwaukee, while experiencing a fair volume of business during the month of August for high speed compound and reciprocating engines, have noted that contracts for large units have been less than for several months. The aggregate of small orders, however, was considerable, the demand coming from electric light plants, railways, cement plants and small industries. Some large contracts are now pending in the Eastern sections of the country. There has been some improvement in the inquiry for engines for export, a few contracts being taken for shipments to London, and one large order, aggregating upward of \$35,000, for shipment to Johannesburg, Africa. There has also been a fair demand for machinery for equipping cement works, this business coming largely from the Pacific Coast, where renewals have been made and where other business of importance is in sight. While business during the last week or so has been relatively quiet, it is announced that the Gates Works branch of the company are better supplied with orders for this sort of machinery than ever before in their history. Some orders also have been taken for export, one contract worthy of notice being for shipment to New Zealand.

The Union Steam Pump Company, Battle Creek, Mich., say that orders have not been booked ahead this year as freely as a year ago, and they do not look for any great improvement during the balance of the year. The company are at present equipping their foundry, which has been in course of construction for the past six months. Some of the contracts which have been received during the month are for large hydraulic pumps and also some sugar refinery and brewery jobs.

The Otto Gas Engine Works, Chicago, report trade conditions as having slightly improved within the past 30 days, this referring particularly to railroad business. The demand for their engines has increased considerably, with special emphasis on immediate delivery. Labor conditions have improved and they have no trouble in getting common and skilled labor.

The American Steam Pump Company, Battle Creek, Mich., state that their business for the month of August has held up well in comparison with August of last year. They have a fair amount booked ahead and anticipate that

the year 1903 will show an increase over 1902. Both domestic and foreign trade have increased, and inquiries and orders come from all parts of the country. The company made extensive improvements to their plant last year and have installed considerable new equipment during the present year.

The Nordberg Mfg. Company, Milwaukee, Wis., report inquiries as numerous as at any time heretofore, but they believe that a slight slackening up in placing orders must occur before long, if it has not already made itself felt.

The Gardner Governor Company, Quincy, Ill., say that orders have come in during the month of August in fair numbers, but not as heavy as the two months previous. While they are busy, it is due to heavy orders which were received during previous months and which could not be given attention owing to the strike difficulties of the past four months. While this strike has been a source of some annoyance, their works are now filled and they are taking care of trade promptly. They notice a slackening tendency which seems quite universal and not confined to any one particular locality.

The S. Freeman & Sons Mfg. Company, Racine, Wis., say that they entered more orders during the month than they will be able to get out in the same length of time. The outlook for business for the remainder of the year is very favorable, there being no let up in the amount of inquiries received. Orders seem to come from all parts of the country and from different lines of business. A partial list of orders entered during August is as follows: Three 150 horse-power internal furnace boilers for Tod-Stambaugh Company, Cleveland, Ohio, mine at Swanzy, Mich.; one Scotch marine boiler for Donegan & Swift, New York City; one 300 horse-power internal furnace boiler for Iron Mountain Electric Light & Power Company, Iron Mountain, Mich.; one 150 horse-power internal furnace boiler for Thos. B. Jeffrey Company, Kenosha, Wis.; one 150 horse-power internal furnace boiler for City of La Salle, Ill.; one 150 horse-power internal furnace boiler for the Carpenter Cook Company, Menominee, Mich.; two 100 horse-power internal furnace boilers for Racine Engine & Iron Works, Racine, Wis.; two 150 horse-power horizontal tubular boilers for Allis-Chalmers Company, Seattle, Wash.; eight 150 horse-power horizontal tubular boilers for the Allis Chalmers Company, Chicago; two 150 horizontal tubular boilers for St. Joseph Brewing Company, St. Joseph, Mo.

Machine Tools.

The American Machinery Company, Grand Rapids, Mich., say that orders received during the month were about 25 per cent. greater than for the corresponding month last year, and shipments increased in about the same ratio, but the amount was less than for any previous month this year, in this respect duplicating their experience for a number of years past. They are running their full capacity in the attempt to accumulate a little stock as well as catch up on back orders. The outlook for future business appears very bright.

The New Doty Mfg. Company, Janesville, Wis., are working on orders which will keep them occupied for some little time. They have recently installed some new machines. They have had considerable trade lately from the railroads and are building a number of large tools for various railroads. They do not consider the outlook for the machinery business as good as it was two or three months ago. They think the recent depression in the value of stocks has had a bad effect.

The Geo. Whiting Company, Chicago, say that the month of August has proved slightly duller than they expected and collections are a little slower. During the past few days they have, however, had new inquiries which seem to be on a live basis, indicating a continuance of new equipment to be put in, both in small and large units. The past month they exported their first machine to Mexico and now look for an increased business in that direction. They have also shipped a machine to California for special work peculiar to that locality, which they believe will lead to more orders. At present there is enough business on their books to keep their plant running for some time, with prospects bright for a continuance of patronage.

The Hoefler Mfg. Company, Freeport, Ill., regard the outlook for business in the machinery line as very encouraging, both domestic and foreign. They sell largely through dealers in the machinery business, who are sending in large orders.

Williams, White & Co., Moline, Ill., say that their business has been very good. There seems to be a tendency toward lower prices on material, but still they see no reason why general conditions should not be very good for a long while to come.

The Fox Machine Company, Grand Rapids, Mich., report that business for the past month has been exceptionally quiet. They are beginning to feel the effects of the strike in the early spring, but they consider the prospects for a good fall business excellent; they think, from present indications, they will largely exceed last year.

McDowell, Stocker & Co., Chicago, state that business for the past month has been much less in volume than for

the preceding month, but is in excess of business for 1902. The last ten days, however, have shown quite an improvement in inquiries, and they anticipate a very good fall trade.

The Ransom Mfg. Company, Oshkosh, Wis., state that the past month has been better than August, 1902. They have noted the usual falling off in trade during the summer months, but are making plans for a heavy fall business. They have just ordered a new Landis grinder, and are making some extensive repairs in their plant. The company consider trade prospects very bright.

Special Machinery.

Barnard & Leas, Moline, Ill., say that they have been seriously handicapped for the past three months owing to a strike of molders, and consequently are very much behind. Compared with last year, they have not been receiving as many orders; probably owing to the strike condition in their shop, which made it impossible for them to promise prompt shipment. The outlook is not as encouraging as last year, and it is their opinion that business during the fall months and winter will be considerably restricted with them.

The Browning Company, Milwaukee, Wis., say that their business for the months of July and August has been much greater than for these same months for several years, and they believe that the outlook for the balance of this year is very bright.

The Stiles-Morse Company, Chicago, report August a fairly good month in their line of sheet metal working machinery. They find, however, that a number of manufacturers who counted on having completed additions to their plant by this time have been disappointed on account of the delay in getting raw material, and it will be after the first of the year when they will need to make large additions in their metal working equipment.

The Stover Mfg. Company, Freeport, Ill., say that business is rather quiet with them. General conditions are not very promising owing to continued wet weather and backward condition of crops.

Tools and Supplies.

Joseph T. Ryerson & Son, Chicago, report considerable improvement in the machinery trade during August. Labor saving tools particularly have been in unusually good demand, and the fact that shops have for the past several years been crowded with work seems to be accountable for the desire on their part to increase facilities which will enable them not only to care for a larger proportion of business but to decrease their shop costs. Increases are not in the line of large units so much as in the direction of completing and rounding out equipments already installed, and they believe that the tendency will be to work still further with this idea in view. Tool makers report their factories full of work and, as a rule, deliveries are still slow, the natural consequence being that prices are well maintained. The company have recently made sales of some importance to the following: Geo. P. Bard, Bayonne, N. J.; Drake, Williams & Mount, Omaha, Neb.; Jackson & Corbett, Chicago; Farrar & Trefts, Buffalo, N. Y.; Lacy Mfg. Company, Los Angeles, Cal.; Practical Gas Construction Company, Waukegan, Ill.; John R. Lowrey, Omaha, Neb.; Union Iron Works, Spokane, Wash.; E. Keeler Company, Williamsport, Pa.; Donaldsville Iron Works, Donaldsville, La.; Hanon, Richards & McCone, San Francisco, Cal.; Central Railway Company, Peoria, Ill.; Detroit & Southern Railway Company, Detroit, Mich.; Buckeye Boiler Company, Dayton, Ohio; P. H. McArdle, New Orleans, La.; C. E. McDaniel, Ottumwa, Iowa; W. J. Adam, Joliet, Ill.

The Chicago Pneumatic Tool Company, Chicago, say that business received during the month of August has been very gratifying to them, although the usual depression incident to this season has prevailed. Still the amount of orders on hand, received during preceding months, has prevented a very noticeable falling off in business at their various plants, and at the same time orders taken during the month were considerably greater than during August, 1902. Reports from their London office are correspondingly cheerful, and they anticipate a very satisfactory future trade.

The Scully Steel & Iron Company, Chicago, report the demand for the past two months, considering the general conditions of trade, has been excellent, particularly in air tools; also boiler makers' machinery, such as punches, rolls, &c. There has not been much inquiry from railroads, business seemingly being curtailed in that direction, although they have a number of inquiries and are at work on several trades which they expect to consummate. The smaller manufacturers are not doing much in new lines but more for renewal. The demand for July and August has been very excellent, and they are figuring on a large lot of business all over the country. Prices are about stationary and no change that they know of is contemplated. They are having quite a good deal of inquiry from foreign countries, particularly South America, and, taking everything into consideration, think the outlook for machinery is quite bright.

The S. Obermayer Company, Chicago, say that business so far this year has been satisfactory in every respect. Their sales have heavily increased over last year, and their manufacturing capacity has been increased over 60 per cent.

since last August. They think that business for the balance of the year will be satisfactory, both domestic and foreign. They do not believe there are as many new concerns starting up, but those that have been established for the past few years seem to be well supplied with orders.

The Novelty Iron Works, Dubuque, Iowa, report that inquiries are more numerous and there is a general tendency toward improvement in trade in the South and West.

Chas. H. Besly & Co., Chicago, report present business very good and the outlook for future trade bright. Shipments to New York, Pennsylvania, Connecticut and Ohio have been especially large in the grinder department. They are also having an exceptionally large demand for their oil from the Pacific Coast and the Northwest. A great many inquiries are being received from Europe, South Africa and Mexico for specialties.

The Wilmarth & Morman Company, Grand Rapids, Mich., are anticipating a good fall trade. Their foreign trade is running about the same. For the Nelson loose pulley, patents of which they recently purchased, they are already behind on orders and are anticipating a very satisfactory trade in that direction. Among recent sales of grinders the company report the following: Dry grinders—Hamilton Machine Tool Company, Hamilton, Ohio; Ideal Electric & Mfg. Company, Mansfield, Ohio; Fore River Ship & Engine Company, Fore River, Mass. (motor driven); James H. Roberts & Co., Boston, Mass.; two to International Harvester Company, Hamilton, Ont.; M. B. Wheeler Electric Company, Grand Rapids, Mich.; Atchison, Topeka & Santa Fé Railway Company, Albuquerque, N. Mex.; Oneida National Chuck Company, Oneida, N. Y.; the Mineral Ridge Mfg. Company, Mineral Ridge, Ohio; seven to London, England; two to Rotterdam, Holland (one for Holland Government); E. Berlinger, Montreal, Can. Wet grinders—Exeter Machine Works, Pittston, Pa.; Henry Martin Brick Machinery Mfg. Company, Lancaster, Pa.; United States Navy Yard, Cavite, P. I. (two direct connected motor driven); Texas Midland Railway, Terrell, Texas; Union Pacific Railway Company, Omaha, Neb.

The Philadelphia Machinery Market.

PHILADELPHIA, August 31, 1903.

There has been considerable falling off in new business in the Philadelphia machinery market during the past month. August is usually a dull month in this territory and has proved no exception this year. It is hardly probable, however, that the quiet of the past month can be entirely credited to "vacation dullness." While it is true that a large amount of business is held up on that account, others have deferred ordering until general affairs reach a more stable level. It is the opinion of a number of manufacturers that the present conditions are forerunners of what is in prospect for the machinery trade for some time ahead, but others think that business will open up next month with a rush, and that September will be a very active month. Which opinion is correct is at this writing difficult to say.

Inquiries have fallen off in nearly all branches of the trade; with some it began early in the month, with others during the last half. Many of the inquiries received have been slow in leading up to business. Some have had the so-called string tied to them, and just when it was supposed that the deal had closed it was just as liable to be called off altogether.

With labor conditions still more or less unsettled in some sections and the effects of strikes, &c., still apparent in others, it is difficult for employers of labor to figure out just where they stand, and the proposed purchase of new tools and machinery is for the time deferred. The lowering prices of raw materials have also delayed purchases to some extent, buyers preferring that the market should find a firm level before additional outlays are made.

Order books are in most cases in fairly good shape, but generally on business which was booked some time ago. Manufacturers of heavy machinery, large special tools, cranes, engines, &c., have a very large amount of work on hand, sufficient to keep them running full for the balance of the year; other shops, however, are not so well fixed, and a few months' business ahead is considered very good.

The local shipyards are busy, but it is said that very little new business is coming in at the present time. Owing to labor conditions in the textile trades the local textile machinery market is dull. With a number of textile mills still idle, the requirements in new machinery and equipment are small, and but little new business is being given out.

The various iron and steel plants continue busy. Deliveries, however, are materially improved, particularly in

gray iron castings. Labor conditions in this branch of the trade have been settled in most instances, though friction still exists in some cases.

Foreign demand for tools and general machinery remains unchanged. A small amount of business in new lines has been done, but nothing to encourage any particular activity in export trade.

There has only been a light demand during the past month for general machinery and medium sized tools and machinery dealers have their floors well stocked. Deliveries on standard tools could be promptly made, but purchasers are scarce.

The demand for smaller engines, tools, boilers and machine shop supplies has, as in other branches of the trade, fallen off to some extent, but manufacturers and dealers expect an early resumption.

Prices generally are firm and unchanged, factory costs continue high, and with order books fairly well filled, there is no indication of any recession in prices at this time.

The new machine shop building for Hugh Bilgram, Spring Garden street, above Twelfth, is now practically completed, and the installation of equipment begun. This shop is probably the most modern in this vicinity, the roof, floor and general interior work being all of concrete. There is an abundance of good light, and facilities for work are to be the best.

The Belmont Iron Works are to build a new plant at Holmes Station, Delaware County, Pa., a site of 7 acres having been acquired on the Baltimore & Ohio Railroad at that place. The old plant at Twenty-second street and Washington avenue is not to be abandoned, but run in conjunction with the new plant. This company make a specialty of iron and steel work for building construction. Work on the new plant is to be started at an early date.

The Standard Pressed Steel Company have started up a portion of their new plant at Nineteenth and Clearfield streets, and several presses are now at work on the manufacture of their new pressed steel shafting hanger. It will probably be a month, however, before these goods in various sizes will be ready for the market.

The Thos. H. Dallet Company have had a number of inquiries for their various lines of machines during the past month, and have taken some very satisfactory orders for drills and stone surfacing tools. Improvements are being made to the plant, and a number of tools have been installed to increase both the range of work and capacity of the plant. Shipments of stone surfacing tools, drills and pneumatic tools to a number of out of town parties are to be noted.

The H. B. Underwood Company have been very busy, both in the line of railway repair shop tools and in general shop work. Orders for special tools have recently been received from several European railways, which is a new field for this line of tools. Portable boring bars, crank pin turning machines, &c., have been delivered to the various shops of the Pennsylvania Railroad, Philadelphia & Reading and other railways, both in the East and West.

The T. H. Johnson, Jr., Company have booked their average amount of orders for lathes during the past month. While inquiries have not been as abundant as might be desired, there is, nevertheless, some very nice business in sight. Deliveries during the month have been confined to the smaller and medium sized tools; some large tools are nearing completion and will shortly be shipped to their respective purchasers.

The Espen-Lucas Machine Works continue busy. Inquiries have been good and prospective business is satisfactory. Some recent deliveries of cold saw cutting off machines include three more machines for steel forging and crank shaft work for the Erie Forge Company, Erie, Pa. The National Malleable Casting Company, Sharon, Pa., have been shipped a duplicate order of two steel foundry saws, and the Barber Stockwell Company, Boston, Mass., have been furnished a second tool for cutting off frogs, rails, &c. A steel foundry saw has also been delivered to the Buckeye Malleable Iron & Coupler Company, Columbus, Ohio, and a horizontal floor boring, milling and drilling machine has been delivered to the Water Department of the city of Philadelphia.

The Falkenau-Sinclair Company continue quite busy. Inquiries are said to be satisfactory and resultant orders include, among others, one for a 30,000-pound vertical screw testing machine and an automatic cement testing machine, both being for the University of Pennsylvania, this city. The Niagara Falls Power Company have ordered nine sets of special driving mechanism for oil pumps, and a sixth order for automatic tool grinding machinery has been received from the Bethlehem Steel Company. Some recent deliveries by the Falkenau-Sinclair Company include a large double head traveling shaper, 18-foot bed, electrically driven by two motors, for the Boston Navy Yard. A 250-ton broaching press is about to be shipped to New Brighton, Pa., parties, this machine to be used for broaching out connecting rod

straps. A number of standard presses have also been delivered, both to local and out of town parties.

The American Pulley Company have noted a slight falling off during the month; orders continue coming in in good number, but not for the same large quantities of pulleys as previously. Foreign demand continues good and some nice orders have been booked for export, particularly to Australia. Deliveries for local and nearby parties have been about as usual, as have shipments to the West and South.

The Link-Belt Engineering Company report a very satisfactory condition of business, the estimating department being kept busy on inquiries, and a number of good orders have been taken. An extensive coal handling plan is to be installed by them for the Passaic Steel Company, Paterson, N. J., while the power house of the National Transit Company, Oil City, Pa., is to be equipped with a plant for handling both coal and ashes. Orders have also been received for coal handling machinery for the new coke plant at Milwaukee, Wis., for the Semet-Solvay Process Company and for coal handling machinery, with a capacity of 200 tons per hour, for the Cambria Steel Company, Johnstown, Pa. A coal trestle will also be erected for the Philadelphia, Baltimore & Washington Railroad at Wilmington, Del. This will be equipped with 14 patent undercut gates and chutes for coaling locomotives.

The crane department of the Niles-Bement-Pond Company continues busy. Inquiries for cranes are reported not as numerous as during July, but a fair amount of business has been taken. The additions to the plant previously mentioned in these columns have been completed, except the new boiler house, which is now being erected, and in which new boilers, heaters, &c., are to be installed, which will enable the present capacity to be doubled.

The Tabor Mfg. Company have been fairly busy during the past month. Inquiries have improved during the latter half of the month, and prospective trade looks good. Foreign demand for molding machines keeps up well, orders for seven machines having just been received for delivery in England. These include the standard 12 x 14 type machine and several power ramming machines. Deliveries continue active to various domestic foundries.

Dienelt & Eisenhart keep busy, particularly in the foundry, which has a large amount of work on hand for the local shipyards. A very good business continues in hydraulic jacks and a number are being shipped to all parts of the country.

The Philadelphia Foundry & Machine Company advise us that they are very busy, particularly in the line of loam work. Some very good contracts for cylinders, liners, pistons and other work of that class have recently been taken. Shipments of heavy and special castings are being made regularly, both to local and out of town customers.

The Philadelphia Roll & Machine Company continue very busy. The demand for charcoal iron castings increases and a larger number of orders for sand and chilled rolls have been taken. A 10-inch and a 12-inch merchant mill are about ready for delivery. These mills are to be completely equipped, including rolls. A number of rolls, both finished and in the rough, have recently been shipped to various iron and steel mills.

The Philadelphia Pneumatic Tool Company continue busy. The demand for pneumatic tools has been good and a number of orders have been taken. Orders for export have also been received from London, England; Copenhagen, Denmark, and from other points in Continental Europe, these being mostly for chipping and riveting hammers. Reaming drills are being delivered to various shipyards, boiler shops and steel plants, while a number of rammers have been shipped to the foundry trade in the Pittsburgh district. Seventeen chipping and riveting hammers have also been shipped to the Jenks Machine Company, Sherbrooke, Quebec, Canada.

The Baldwin Locomotive Works continue busy in all departments. Inquiries, we are advised, are more numerous, and conditions favor an increase of business from the various railways. Work on their new erecting shop at Twenty-ninth street is being pushed rapidly, and it is hoped that this, as well as other constructional work under way, will be completed before the end of October. Some of the equipment of this new shop includes an 80-foot turn table and two 25 and one 100 ton cranes, the latter to be of a radial type. Plans have also been filed for a new power house at Twenty-seventh and Aspen streets. This building is to be 63 feet 6 $\frac{1}{2}$ inches by 40 feet and 36 feet high. Among some of the locomotives recently shipped by these parties was one of the new balanced compound Vauclain type for the Atchison, Topeka & Santa Fé Railroad. This engine was exhaustively tested on the run out and more than satisfied all expectations. Locomotives of the various passenger and freight types have been recently shipped to the Pennsylvania Railroad Company, Chicago, Milwaukee & St. Paul Railroad, Seaboard Air Line, Wabash, Southern Pacific, and other roads. Passenger engines of a new double end type have also been delivered to Philadelphia & Reading Railroad, for use in the suburban traffic, while Baldwin Westinghouse electric locomotives have been furnished the Dawson Fuel Company, Dawson, N. M.; Passaquola Street Railway & Power Company, Scranton, Miss.; National Mining

Company, Sygan, Pa., and the Zenith Coal & Coke Company, North Fork, Pa.

Metal Market.

NEW YORK, September 2, 1903.

Pig Tin.—During the week under review the market has declined steadily, reaching its lowest point this morning with 26.87 $\frac{1}{2}$ c. for spot and 26.75c. for futures. Toward the close of the market, however, prices worked up to 27.10c. to 27.15c. for spot and 27c. to 27.15c. for September, which were the closing prices. The low prices of yesterday are said to have stimulated demand from the interior somewhat, and this increased demand is reported to be the cause of the stiffening of values to-day. Prior to yesterday business was extremely slow. An evidence of the recent slack demand is shown by the fact that for the entire month of August the deliveries into the interior amounted to but 2500 tons, while the monthly average so far this year brings the deliveries up to 3500 tons. The statistics published yesterday by the New York Metal Exchange, extracts from which are printed below, are unfavorable:

The total visible supply on August 31 is 251 tons above that of August 31 of last year.

	Tons.
Arrivals at the Atlantic ports amounted to.....	3,610
Total arrivals since January 1, 1903.....	25,407
Of which from Straits by direct steamers.....	11,316
Of which from United Kingdom.....	12,680
Of which from Holland.....	716
Of which from European Continent.....	695
The deliveries for August we figure as.....	2,500
Total deliveries since January, 1903.....	27,500
Deliveries same period in 1902.....	23,600
The shipments from Straits amounted to.....	5,215
Against previous month.....	4,595
Against August, 1902.....	5,200
Australia shipped.....	375
Against previous month.....	356
Against August, 1902.....	316

Statistics for the United States, Pacific ports excluded, August 31, show as follows:

	Tons.
Stocks, including on dock and arrivals.....	2,029
Afloat	1,635

Total 3,664
The total statistics for Europe and the United States show:

	Tons.
Total visible supply August 31, 1903.....	16,544
Against visible supply July 31, 1903.....	16,507
Against visible supply August 31, 1902.....	16,298

The London market also declined considerably during the week and closed more than £3 below last week's figures, with £122 15s. for spot and £121 15s. futures.

Copper.—Extreme dullness continues to characterize this market. Consumers are buying more sparingly than ever, and during the last week there was practically nothing doing in the way of Lake or Electrolytic. Casting was cut to the extent of $\frac{1}{4}$ c. from the "official" prices, which are unchanged from last week and as follows: Lake, 13.75c. to 13.87 $\frac{1}{2}$ c.; Electrolytic, 13.62 $\frac{1}{2}$ c. to 13.75c.; Casting, 13.37 $\frac{1}{2}$ c. to 13.50c. The exports during the month of August were somewhat larger than the month previous, amounting to 10,256 tons, but the total for the eight months of this year shows a decrease of 35,327 tons, as compared with the corresponding period of last year. The imports for the first seven months of this year aggregate 42,385 tons. The comparative statement of apparent consumption of Copper in the United Kingdom as per Board of Trade returns shows a wide decrease for the first seven months of this year, the total being 44,907 tons, in contrast to 61,340 tons for the corresponding period of 1902. The London market was quiet and closed lower than last week, with £58 10s. for spot and £57 12s. 6d. for futures. Best Selected declined 10 shillings to £63 10s.

Pig Lead.—The market firm, but a shade easier in tone. The prices of the American Smelting & Refining Company are unchanged, being on a basis of 4.10c. for 50-ton lots and 4.12 $\frac{1}{2}$ c. in carload lots. Outside lots of spot are quoted here 4.25c. The London market has declined slightly to £11 2s. 6d.

Spelter.—The market is strong and unchanged, and spot to August closed to-day at 6c. The London market has declined, being quoted to-day £20 17s. 6d.

Antimony.—Cookson's is easy at 7.25c., while Hallett's is unchanged at 6.37 $\frac{1}{2}$ c., and other brands at 6c. to 6.25c.

Nickel.—Is quoted at 40c. to 45c. for large quantities, and 50c. to 60c. in small lots.

Quicksilver.—The market continues at \$47.50 for flasks of 7 $\frac{1}{2}$ lbs. London cables £8 10s.

Tin Plate.—The market is quiet. The American Tin Plate Company quote \$3.80 per box of 14 x 20 100-lb. Cokes, f.o.b. mill, equivalent to \$3.99, New York. English cables are 11 shillings 9 pence for Plates in Wales.

Labor News.

The strike of the machinists employed at the shops of the Boston & Albany division of the New York Central Railroad has been brought to a close by an agreement entered into by the company and the union by which the men get a nine-hour day, but not with ten hours' pay, their pay per hour remaining unchanged. The officials of the railroad made the concession that overtime at the rate of one and one-half hours' pay for each hour work shall be paid after nine hours, instead of after ten hours, as heretofore. Practically all the men who went out at West Springfield and Allston, Mass., have returned to work, and the same is true at Rensselaer, N. Y., though a faction of the men in this shop are not at all satisfied with the defeat, as they themselves term it. The blacksmiths employed in these shops are expected to agree to a similar arrangement of their difficulty. The car workers employed by the road, who were granted a nine-hour day with nine hours' pay, are now moving back to the old ten-hour schedule. It is now stated by Boston & Albany officials that there is only a very remote possibility of the shops being moved from West Springfield to Worcester. The announcement was made by the company soon after the strike began that Worcester would get the shops and also the big round house, the contract for which had been let, to be erected at Springfield. It is understood that the contract, once abrogated, will be renewed and that building will go along at Springfield as if nothing in the way of a strike had occurred. It is pretty certain, however, that if the strike had continued Worcester would have got the shops because of the excellent condition of labor among the machinists of that city.

An injunction has been obtained by the Buffalo Furnace Company restraining the National Association of Blast Furnace Workers and Smelters of America, Local No. 2, from interfering with the company's business and employees in any form or manner.

The slight labor trouble among the employees of the Stark Rolling Mill Company, at Canton, Ohio, has been satisfactorily adjusted. This company are manufacturers of common, cold rolled, pickled and annealed steel sheets and are operating their plant to full capacity.

The employees of the Valley works of the Republic Iron & Steel Company, at Youngstown, Ohio, have organized the Mahoning Valley Relief Association, to pay sick and funeral benefits.

The eighth annual convention of the Metal Polishers', Buffers', Platers', Brass Molders' and Brass Workers' Union was held in Cleveland recently. During the year ending August 1, 1903, charters were issued to 95 new locals, which makes a total of 237 locals, with a combined membership of 20,788. The matter of securing a nine-hour work day was given prominence, and a systematic policy looking to this end during the ensuing year was outlined.

Demands which are typical of trades unionism, and which are somewhat radical in comparison with the "agreements" which are sought with employers' associations nowadays, have just been made upon Philadelphia employers of metal workers. If the Philadelphia "agreement" is not complied with by the employers the union threatens a general strike. The "agreement" is submitted to the employers for their signature by the Journeymen Metal Roofers', Tin Plate and Sheet Iron Workers' Protective and Beneficial Association. Some of the most interesting of the demands follow:

The business agents shall have access to the shop at all times, upon application at the office.

A sympathetic strike, when ordered by the Allied Building Trades Council or its agents, through the business agents of this local, shall not be considered as a violation of this agreement.

That no man shall be discharged for demanding the card of any man employed at the shop in which he is working.

That in cases where the association cannot fill the demand for men, and upon being duly notified through its regular business agents of that fact, the men employed to do the work must become members of the association.

Every shop shall have the privilege of employing one ap-

prentice for every five men, and one additional apprentice for each additional five men, or majority fraction thereof.

All helpers registered in the association on or before February 1, 1903 (and none others will be recognized as helpers) will be entitled to receive whatever information and assistance they may require from any members of this association, in order that they may be enabled to attain such a degree of efficiency as to command the wages of a journeyman.

All helpers are and must remain under the absolute control of the aforesaid association, and any violation of the constitution or by-laws of this association or any article of this agreement will debar them from all rights and privileges of this association.

Any man working on a building or in a shop, who is not a member of this association, or a registered apprentice, or registered helper, shall be classed as a laborer, and must not be allowed to use tools necessary for sheet metal work.

Any man who has served or claimed to have served an apprenticeship in the sheet metal business, in this or any foreign country, shall not be allowed to register as an apprentice in this association, but must make application as a full member of the association.

A minimum wage rate of 40 cents an hour is demanded together with a 44-hour week. Work after 5 o'clock p.m. is to be paid for at the rate of time and a half up to midnight, and after that hour until 8 o'clock a.m. double time is to be paid.

Efforts to call a general strike at all of the marine shops and shipyards in the vicinity of New York, in sympathy with the machinists who are now on strike, have thus far proven fruitless. The machinist's places have been filled by the New York Metal Trades Association, and injunctions have been granted restraining the striking machinists from interfering with the new men. The Blacksmiths' and Helpers' unions and the Brotherhood of Boilermakers were asked to strike in sympathy with the machinists. As these unions have agreements with the employers, they refused to strike. The Central Federated Union have, as a result, expelled the boilermakers' organization, and efforts are being made to also suspend the Blacksmiths' and Helpers' unions.

Frank Buchanan, president of the International Association of Bridge and Structural Iron Workers, has announced a plan for the amalgamation of six large building trades organizations. A meeting to perfect the organization will be held in Indianapolis on October 9. The following platform has been suggested:

No demand for increased wages or changed working conditions from the time work on a contract is begun until it is completed.

No demand of any kind without 90 days' notice.

No indorsement of strike of affiliated body unless the same conditions are met by the other body.

General co-operation with the contractor.

Abolish the frequent strike.

Besides the officers of the Structural Iron Workers who will attend the conference, there will be representatives of the United Brotherhood of Carpenters and Joiners, the Bricklayers' and Masons' International Union, the United Association of Plumbers, Gas Fitters, Steam Fitters and Steam Fitters' Helpers, the Brotherhood of Painters, Decorators and Paperhangers and the Building Trade Laborers' International Union.

The Lookout Mountain Iron Company.—Work is progressing rapidly on the new \$1,000,000 plant of the Lookout Mountain Iron Company, at Battelle, De Kalb County, Ala., and it is expected that the furnace will be ready for blast in the first quarter of 1904. Two batteries of 38 each of the 300 bee hive coke ovens now under construction are completed, and some time during the present month the company will be ready to make coke and ship coal. Within the next two or three months two additional batteries of the same number of coke ovens will be ready for operation. A boiler plant has been placed between the ovens for utilizing the waste heat, and which will be used for running the general power plant, which includes large compressors for mining the coal with compressed air, coal cutting machinery, generators for supplying the electricity for running the coal crushers, conveyors and larries for the coke ovens, pumps, &c. The company have opened up three coal mines, having a capacity of about 1000 tons per day, and are opening up three ore mines of ample capacity to supply the blast furnace.

PERSONAL.

Directors William McMaster of Montreal, Frederic Nichols of Toronto and W. B. Ross of Halifax have been appointed a committee to manage the affairs of the Dominion Iron & Steel Company and the Dominion Coal Company, pending the negotiations for a readjustment of the existing operating agreement. No successor has yet been elected to the vacancy in the presidency made by the resignation of James Ross.

L. P. Clark of Allentown, Pa., has been elected general manager of the Composite Metal Company, Catasauqua, Pa.

John Galvin, formerly superintendent of the Peru Steel Casting Company, Peru, Ind., has been appointed superintendent of the Indiana Steel Company's works at Indiana Harbor, Ind.

Charles James has resigned as general manager of the Norway Iron & Steel Company, York, Pa., to become manager of the American Car & Foundry Company's plant, at Berwick, Pa.

Ralph McCarty, formerly with the Bignall & Keeler Mfg. Company, is now president and general manager of the Stoeber Foundry & Mfg. Company of Myerstown, Pa. John H. Killinger, formerly president, is now vice-president.

M. A. Neeland, general manager of the William Tod Company, Youngstown, Ohio, has sailed for Europe, and will be gone about two months.

Frank McDonald has been appointed superintendent of the Bessemer plant of the Republic Iron & Steel Company, at Youngstown, Ohio, to succeed P. D. Mackey, who recently resigned to accept the position of general superintendent of the Bessemer plant of the National Tube Company, at Wheeling, W. Va.

Thomas J. Jones, formerly manager of the blast furnace at Sharon, Pa., but during recent years manager for P. L. Kimberly in the operation of iron ore mines on the Mesaba range, has severed his connection with the ore business and returned to Sharon.

George E. Sehmer and Fr. Rottman of Ehrhardt & Sehmer, the well-known steam engine builders of Saarbrücken, Germany, are in this country for the purpose of visiting steel plants and inquiring into American steam engine practice.

Richard Crocker, for the past six years head of the electrical and testing department of the Holly Mfg. Company, Lockport, N. Y., has resigned his position with that company and formed a new connection with the Acker Process Company of Niagara Falls.

Thomas Lynch, president of the H. C. Frick Coke Company, has returned to Pittsburgh from an extended trip to Europe.

Julian L. Yale has been appointed Chicago sales agent of the Lackawanna Steel Company. Mr. Yale was general sales agent of the Illinois Steel Company for a number of years, and since his retirement from that position has represented manufacturers of railroad specialties, thus maintaining close connection with railroad interests.

Tin Plate Lockout in Wales.—A cable dispatch from Swansea, Wales, dated August 29 says: All the South Wales tin plate works controlled by the Employers' Association closed to-day for an indefinite period, in consequence of a wages dispute. From 20,000 to 30,000 workmen are affected. The dispute is of long standing and is based on the method of payment for certain classes of plates. The employers insisted that their demands be accepted unconditionally and the workmen refused to agree to this. The lockout affects four-fifths of all the mills. About a dozen non-associated works continue in operation. The locked out men will be supported by the unions. It is anticipated that the steel workers of the district will strike in sympathy with the tin workers.

The Le Roy Shot & Lead Works, New York, have moved to the Empire Building, 71 Broadway, where they occupy offices in connection with the general offices of the United Lead Company, of which they are a branch.

New Publication.

The Adjustment of Wages. A Study in the Coal and Iron Industries of Great Britain and America. By W. J. Ashley, London, England. Longmans, Green & Co. Pages 361, with four maps.

During the first three months of 1903 Professor Ashley delivered a series of eight lectures at Manchester College, Oxford, England. These lectures consisted of a general historical review and a philosophical discussion of trades unions and trades unionism as they have affected two great industries in Great Britain and the United States—coal mining and iron making. By publishing the lectures in book form Professor Ashley has contributed an interesting and valuable volume to the literature of this, at present, all absorbing topic. As he states in the preface, the author and lecturer has not attempted to solve any of the problems of industrial organizations, and herein might be said to lie the only criticism that can be made of the manner in which he has treated the subject. Professor Ashley has a thorough knowledge of the history and of the present condition of trades unionism, particularly in the two trades which he has taken for the subject of his discourses, and one reading the book or listening to the lectures might naturally expect suggestions in the way of dealing with some of the vexed questions of the hour. Except for the slight disappointment felt on this point after a careful reading of the volume, one must recognize that the author is entitled to the thanks of all students of economics for this unbiased, lucid and thorough discussion of the relations of organized capital and organized society.

To the majority of readers the most interesting of the eight lectures are the three which treat of: 1. British boards of conciliation, and what they have accomplished in the way of preventing or settling strikes in that country. An important feature in the negotiations before such boards is the apparent confidence which employers have in the secretaries or other responsible officials of the unions, and that these are usually conservative, intelligent men who desire to be fair to both sides, but who frequently have more trouble with their own members than with their supposed antagonists. 2. Prices and wages and their effect upon each other. 3. The legal position of trades unions. This last subject, or the making of unions legally responsible, is the great bone of contention in many of the battles between capital and labor. In England it has been, Professor Ashley states, practically settled by the famous Taff-Vale railroad decision. So far as this country is concerned the evidence quoted makes it appear that the objection to incorporation, or otherwise assuming legal responsibility on the part of the trades unions, is a confession of criminal intent when necessary to accomplish their purpose, and the desire to continue the enjoyment of immunity from punishment which irresponsibility confers. This is abundantly evident from the opinions of labor leaders and others quoted in this chapter.

Another interesting chapter or "lecture" is the one on the anthracite problem in the United States. It contains a concise review of the troublous history of the anthracite region, of the years of gross mismanagement, of the hard struggles for existence, &c., down to the spring of 1903. The lecturer believes that the appointment of the Anthracite Coal Strike Commission and its award was "a distinct step in the corporate negotiation of wages," although the refusal of the commission to compel an agreement between the operators and the United Mine Workers of America crushed the hopeful anticipations of the officials of that organization.

About one-half of the volume is taken up by appendices containing illustrative documents, such as reports of boards of conciliation, copies of joint agreements, &c., which are valuable for reference.

The strike which has been in progress during the past six months at the sheet mill plant of the Ashland Sheet Mill Company, Incorporated, Ashland, Ky., has been satisfactorily adjusted, the men finally agreeing to resume work under the old agreement which the company had with them. The plant is expected to be in complete operation not later than September 8.

HARDWARE.

THE expedient of some manufacturers of having in their factories a system, more or less definitely and formally announced, under which they encourage and reward suggestions received from their workmen, which they are able to put into practice, is based upon so sound a principle that it should be found in more general use. A wise foreman or employer is always on the lookout for points concerning improvements which may be made in the running of the plant, or in any of the details of its various operations. The skill of one thus in charge is indeed often satisfactorily gauged by the improved methods which little by little and almost constantly are being introduced. While each change in itself is usually the acknowledgment of imperfection in former methods, it is also a sign of progress and the mark of a vigilant and growing ability. It is in accordance with the American manufacturing principle of continually being on the lookout for a better method of doing a thing which was well done before. The effort should be made to infuse something of the same spirit into the workmen in the various grades of responsibility. Instead of treating with scant courtesy, if not with open rebuff, suggestions that may be made by employees, such suggestions should not only be gladly received and given due consideration, but it should be understood that any suggestions in regard to improvement in any department or in any process are invited, and will be recognized in a substantial way if it is found desirable to adopt them. A simple scheme can easily be devised by which the obtaining of such suggestions will be greatly facilitated and their worth recognized in modest prizes or other remuneration. The opportunity thus given to the workman will stimulate his self respect and tend to make him bring a greater intelligence into his efforts. Such a system is likely, too, to bring operatives and the management into closer and better relations. In addition to all this, it is the experience of those who have tried this plan that valuable suggestions are in this way elicited.

There is no reason why there should not be in mercantile houses an effort in the same direction. Many of the clerks are bright young men, who have ambition and are full of ideas, good, bad and indifferent. If it is announced that a certain sum, which need not be large, will be given for every idea, properly elaborated and presented, which is of sufficient practical merit to be adopted, or even if such ideas are invited without remuneration, there is little doubt but that in many cases there would be an earnest effort on the part of employees to devise and suggest improved methods. The merchant who is willing to make such an experiment must of course get himself into the frame of mind which will enable him to pass fairly on suggestions thus made to him, the adoption of which might seem to involve an acknowledgment that his own methods, perhaps long in use, are not above criticism. Unless, indeed, he is willing to treat with open mind and absolutely fairly any changes thus proposed it will be not only useless but unwise for him to inaugurate any such system. The probability, however, is that there are those in his employ who see things at a different angle from that at which he views them, and being in some respects in closer touch with actual conditions are in a position to propose new lines of work or new methods which might with marked advantage be adopted. While dignity, authority and capital belong presumably to the employer, he has not a monopoly of the brains, or, if his

subordinates are worth anything, of the business ability and judgment which are represented in his establishment.

Condition of Trade.

Business continues in fair volume, although the movement is not specially heavy. The season, as represented in agricultural products, is undoubtedly late, and this has its influence on commercial matters. It is anticipated, however, that after Labor Day, which is coming more and more to be recognized as the termination of the summer quiet, there will be an evident increase in the activity of trade. In dry goods, a line which is usually earlier in its movement than Hardware and iron products, there is already indication of a more active demand. Reports from the country at large in regard to general business conditions are for the most part satisfactory. The volume of business in representative lines during the month just passed, compares favorably with August a year ago. The reports, too, from the railroads in regard to the volume of freight are entirely satisfactory, and there is already an indication of a coming shortage in cars and consequently delay in transportation. The crops, while not all that was hoped for a few months ago, are apparently to be at least up to the average, and with the excellent prices which prevail it is assured that the farming population will have little reason for complaint. There will apparently thus be a substantial basis for a continuance of prosperous conditions. In the matter of prices in Hardware and related lines there is little to report. The open changes during the week have been few and unimportant. Some lines which lie near the raw material continue to give evidences of softening, and on many of the finer products there is a disposition on the part of manufacturers to make slight concessions with a view to inducing business. These, however, are not important, but simply reflect the fact that manufacturers are somewhat more desirous of securing business than they were under the heavy pressure to which they were so long subjected. While there is a slight reduction in the cost of goods, on account of the decline in the raw material, this is more than counterbalanced by the increase in labor and other incidental expenses connected with their production. With the likelihood that they will have more goods available for export than heretofore, many of the manufacturers are giving more attention to the securing of foreign business, and the increased quantities of Hardware and metal products which are now going abroad indicate the success with which foreign markets are cultivated.

Chicago

(By Telegraph.)

Manufacturers of Wire and Nails have noted a further decided improvement in orders received during the last week, the result being that the tonnage for the month of August booked by the largest interest is in excess of the business taken for August last year. Jobbers have placed larger contracts and have demanded such prompt shipments that already the accumulated stocks of Nails have been badly broken, and the fact that one or two mills are still out for repairs has induced other mills to run on double turn. Prices are well sustained and the outlook for further business during the fall is encouraging. At present the outlook for corn is much better than several weeks since, and if frost does not occur the two-billion crop seems assured. Some very satisfactory contracts have been taken for Shafting and Hangers, and some large contracts for the same material are now pending. In the aggregate there has been quite a fair movement in heavy goods, but in not a few lines the increasing business has been at the expense of prices. Black Sheets have been especially heavy, and lower store prices have been made than for many weeks. The same is true of

Light Plates, but there has been a better movement of Bars and of small Structural Shapes at the recent decline of prices. Bolts, Nuts, Washers and Chain have continued to move slowly and are somewhat easier in tone, but there has been a good demand for Stove Bolts and Rivets, with further contracts of moment placed. Prices of Bolts and Nuts are not well sustained, but Rivets and Stove Bolts have been steady. The continued wet weather has been against an increase in sales of Tire Bolts. Local distributors of Hubs, Spokes, Ribs and other Wagon and Carriage Wooden Material report some little increase in business, with the tendency still toward appreciation of stock. There has been an especially good demand for Axe Handles, which are scarce in this market, and the tendency of prices is upward. Horseshoes, Anvils, Blacksmiths' Forges, hand Blowers and other Blacksmiths' Supplies are selling a little more freely. There has also been a decided improvement in Builders' Hardware, a number of local contracts having been taken by manufacturers' agents, including the Hartford Building, a family hotel, and some minor office and flat buildings and warehouses. Under the new ruling of the United States Treasury Department the finishing of the Custom Houses at Chicago and Indianapolis will now be pushed, and interest is again centered in the contracts for Hardware, which will follow. The contract for the Builders' Hardware to be used in the sanitarium at Waukesha was placed within the past few days with the agent of an Eastern manufacturer, and there is considerable business of this character still in sight, which is encouraging to manufacturers. A firmer tone has been developed in goods with less disposition to cut prices resulting from keen competition. It is reported that fine goods will be advanced soon. Strap and T Hinges have been selling moderately well and have been well sustained, while Wrought Steel Butts have continued to be sold at concessions. Manufacturers' agents report a further material increase in orders taken for Hatchets, Hammers, Screw Drivers of various kinds, Automatic and Reciprocating Drills and similar Tools. The largest jobbers report that sales during the month of August in the aggregate will probably be equal to, if not slightly over, the volume of business in August last year; but there was a falling off in city business incidental to strikes, while the country trade was largely in excess. There has been a freer movement of fall goods of the usual class, including Stove Boards, Coal Hods, Stove Pipe, Elbows, Axles, Lanterns, Ammunition and Cutlery, in fact, the local trade on the latter item has increased materially during the last ten days. There has been a sharp advance in Spelter during the week, and also a stronger market for Copper, which it is expected will be reflected in manufactured goods shortly. There has been a better movement in Laundry Goods and Kitchen Utensils and a general quickening throughout Shelf Goods and Specialties.

St. Louis.

(By Telegraph.)

The steady volume of business in the Hardware market continues, and dealers show disposition to keep stocks complete and to order liberally of seasonable lines. The record of the past month in jobbing circles has been a flattering one, and now that the full force of the buying of fall and winter requirements will be in order it is thought that the current month will be a great one in its total of sales. Trade in Wire products has been considerably more active during the past week.

Omaha.

LEE-GLASS-ANDRESEN HARDWARE COMPANY.—Trade conditions in the Trans-Missouri region continue about the same as noted in previous reports. The demand is for all lines that may be termed seasonable, and the general volume of orders is of a satisfactory character.

The prospects are favorable for a fair yield of corn. On account of the recent extremely heavy rains a full average crop is not expected. Farmers are obtaining substantial values for all their productions, and as the small grains crop recently harvested proved to be of excellent quality and a heavy yield, the general condition of affairs throughout the country districts may be considered as quite satisfactory.

As far as fluctuations in prices are concerned the

Hardware market is comparatively featureless, and as most lines appear to occupy a fairly firm position, it is expected that values in a general way will remain about where they are for the remainder of the year.

Baltimore.

CARLIN & FULTON.—The conditions of trade are very much unchanged from the time of our last letter, except that as the fall season approaches there is the usual increase in business, especially in lines pertaining to cooler weather. From all that we can learn trade in all lines is at the present time excellent, though the agricultural sections are suffering from a great amount of cold, wet weather, which is having an injurious effect upon corn.

The price of cotton, which bids fair to be quite satisfactory for the balance of the year, is helping trade very much in certain sections. We regret to say that there is considerable complaint from that portion of our market in which tobacco is the great staple, and for which unfortunately there is but one buyer, we might say, throughout the world. It is a most unsatisfactory condition of affairs when any great product or staple in which a large section of the country is interested, and upon which it largely depends, is dependent for its price upon the mercy, you might say, of but one purchaser, all others having been driven out of existence. It would be a sad thing for the agricultural community at large, and thereby the entire country, were the cotton, the wheat and the corn crops placed in the same position as to markets as is the case with the tobacco crop.

We already begin to hear the usual talk of the scarcity of cars, and suppose that as the time draws near for moving crops the annual famine in transportation facilities will occur, though the roads have undoubtedly during the year made great efforts to relieve the congestion which ruled last year.

Cleveland.

THE W. BINGHAM COMPANY.—There is a steady demand for all kinds of Shelf Hardware, especially in the Builders' Hardware line, such as house trimmings, as at this time of the year buildings that have been in process of erection during the summer are being finished up.

Fall goods are going forward to customers as rapidly as the manufacturers can furnish them. There are a few shortages in some lines, but from the promises we get from the manufacturers to complete our orders, we hope to be able to clean up our fall orders soon.

Orders for General Hardware are coming from our salesmen, showing that stocks throughout the country are evenly depleted, and sorting up orders contain a good many items. We look for a steady trade all through the balance of this year.

Nashville.

GRAY & DUDLEY HARDWARE COMPANY.—Inquiry among the various Hardware houses here, both wholesale and retail, develops the fact that trade is unusually good for this season of the year. We are passing through a spell of remarkably warm weather for this section, but it seems not to have retarded business very much.

The final adjustment of labor troubles at Birmingham, or rather the verdict of the Arbitration Committee, seems to have been quietly accepted by both sides.

There is no material change in the situation here since our last report. Crop prospects are still good. The South has reason to expect a fine fall business.

Portland, Oregon.

CORBETT, FAILING & ROBERTSON.—August trade as compared with August last year proves disappointing. Business in the first seven months of this year came with the snap and vim that showed underlying strength that is now lacking and forebodes ill for the fall trade.

Crops in many sections of the Pacific Northwest, particularly in Eastern Washington and Oregon, are one-third short, but the high prices prevailing more than make up for the short yield. As is the case, however, generally with the farmer, more are inclined to hold wheat at 70 cents for a higher price than they are when market opens at 50 cents. This applies to other products as well as wheat and is a handicap on trade.

Plumbers are out on strike for \$5 to-day, and building, that has been resumed with vigor since settlement of spring strikes, will now probably have a serious setback, as master plumbers say they are determined not to meet the raise.

Now that Colombia has rejected the Panama Treaty, we of the Pacific Coast imagine that we can see the cloven foot of the railroads. It is easier for their emissaries to handle these South American Republics with their gold than to invade the halls of Congress and bid their minions to do their bidding at this end.

Last week's bank statement in its loan account, showing increase of \$9,500,000 in loans, indicates to what extent New York banks will go to bolster up their watered securities, both industrial and railroad, that Wall street is gambling in, and makes a gloomy outlook for legitimate business, for as surely these watered stocks will collapse and legitimate business be dragged down with them.

NOTES ON PRICES.

Wire Nails.—The demand shows an improvement for the season, and the tone of the market remains firm. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carload lots.....	\$2.00
Retailers, carload lots.....	2.05
Retailers, less than carload lots.....	2.15

New York.—The local demand for small lots from store is fairly good considering conditions. Nearby points tributary to this market are also feeling the effects of labor troubles. The market is firm at the following quotations: Single carloads, \$2.20; small lots from store, \$2.25 to \$2.30.

Chicago, by Telegraph.—Some liberal orders for a general assortment have been placed by jobbers during the week and already accumulated supplies have been cut into seriously. The present is satisfactory and the future outlook is encouraging, the market remaining firm, with the prospect that no change in prices will be made in the near future. Sales continue to be made at \$2.15 to \$2.20 for carload lots, f.o.b. Chicago. Broken cars sell at 5 to 10 cents higher. For galvanizing 75 cents per keg and for tinning \$1.50 extra per keg is charged.

Pittsburgh.—Demand for Wire Nails is showing betterment, which is taken to indicate that the fall trade is already opened up. The mills have good sized stocks of Nails on hand and are able to ship out orders very promptly. The tone of the market is firm, and we are advised that prices are being rigidly held. We quote \$2 in carloads to jobbers, \$2.05 in carloads to retailers, and \$2.15 in small lots, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days. For galvanizing Nails 75 cents per keg is charged and for tinning Nails \$1.50 per keg extra.

Cut Nails.—At the meeting of the Cut Nail Association, held on August 27, no change was made, but previous prices were reaffirmed for the month of September. The opinion prevailed that increase in demand would result from a reduction in prices. Quotations are as follows: \$2.15, base, in carloads, and \$2.20 in less than carloads, f.o.b. Pittsburgh, plus freight in Tube Rate Book to point of destination; terms, 60 days, less 2 per cent. off in 10 days.

New York.—No improvement in the local demand has taken place. Purchases are for small lots for immediate requirements only. Quotations for carloads and less than carloads are as follows: Carloads on dock, \$2.29; less than carloads on dock, \$2.33; small lots from store, \$2.40.

Chicago, by Telegraph.—A moderate movement has been experienced in Cut Nails, and the mills continue to ship promptly on all business received, sales being made on the basis of \$2.30 in carload lots and \$2.35 for less than carload lots for Steel, Chicago. Iron Nails are held at \$2.45 to \$2.50 per keg from store.

Pittsburgh.—A meeting of the Cut Nail Manufacturers' Association was held on Thursday, August 27, when August prices were reaffirmed for September delivery. Demand for Steel Nails is fairly active, but for Iron Nails is rather quiet, and one large factory has stopped

making them. Mills are able to ship out very promptly, having good sized stocks of Nails on hand. Prices are firm, and we quote: Steel Cut Nails, \$2.15, base, in carloads and \$2.20 in less than carloads; Iron Cut Nails, \$2.25, base, in carloads and \$2.30 in less than carloads, plus freight in Tube Rate Book to point of destination, 60 days, less 2 per cent. off in 10 days.

Barb Wire.—The Western demand shows some improvement over previous requirements, while further East new business being received by the mills is smaller. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Galv.
Jobbers, carload lots.....	\$2.30	\$2.60
Retailers, carload lots.....	2.35	2.65
Retailers, less than carload lots.....	2.45	2.75

Chicago, by Telegraph.—Manufacturers report a material increase in business for September delivery and a larger tonnage distributed during August this year than in 1902. In fact, the prospect is so encouraging that some mills have been placed on double turn. The tone of the market is firm, without change in prices. Galvanized Wire is selling on the basis of \$2.75 to \$2.80 in carload lots, and Painted at \$2.45 to \$2.50, the outside price being to retailers. For small lots 5 to 10 cents extra is charged. Staples in carload lots sell as follows: Polished, \$2.30 to \$2.35, and Galvanized, \$2.70 to \$2.75, the outside price being to retailers.

Pittsburgh.—A slight improvement in demand for Barb Wire is noted, and it is believed an active fall trade will soon open up. The mills have heavy stocks and can ship out very promptly. The tone of the market is firm. Prices are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days: Painted, \$2.30; Galvanized, \$2.60, in carloads to jobbers; Painted, \$2.35; Galvanized, \$2.65, in carloads to retailers; Painted, \$2.45; Galvanized, \$2.75, in small lots to retailers.

Smooth Fence Wire.—The conditions prevailing for the past week or two continue. Demand appears to be somewhat irregular, from some sections of the country being larger than from others. Quotations are as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads.....	\$1.90
Retailers, carloads.....	1.95
Less than carloads.....	2.05

The above prices are for base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

	6 to 9	10	11	12	12½	13	14	15	16
Annealed.....Base.	\$0.05	.10	.15	.25	.35	.45	.55		
Galvanized...Base.	\$0.30	.35	.40	.45	.55	.65	1.05	1.15	

Chicago, by Telegraph.—Further improvement is noted in the demand for both Smooth Wire and Fencing and manufactured articles, while the outlook is much improved for the future. The market remains firm in tone without change in prices, which are as follows: Nos. 6 to 9, \$2.05 to \$2.10 in carload lots on track, and \$2.15 to \$2.20 in less than carload lots from store; Galvanized, 30 cents extra for Nos. 6 to 14 and 60 cents extra for Nos. 15 and 16.

Pittsburgh.—There is a fairly active demand, which is expected to increase just as soon as fall trade opens up. The mills expect a good business in the next two or three months, and with large stocks on hand are prepared to make prompt shipments on contracts. There is no change in prices, which are as follows: Plain Wire, \$1.90, base, for Nos. 6 to 9 in carloads to jobbers, \$1.95 in carloads to retailers and \$2.05 in small lots to retailers; Galvanized, 30 cents extra for Nos. 6 to 14 and 60 cents extra for Nos. 15 and 16.

Tool Chests.—The American Tool Chest Company, 200 West Houston street, New York, in their illustrated catalogue recently issued of Tool Chests for all classes of persons, from child to mechanic, including Chests only, or fully equipped with tools from the inexpensive to high grade, fully warranted, quote a discount of 50 per cent. for dealers, with a concession from this for wholesalers and jobbers. These goods are especially adaptable to the fall and holiday trade.

Leather Belting List.—Jewell Belting Company, Hartford, Conn., announce that they have adopted the Leather

Belting list of the Leather Belting Manufacturers' Association, so that all future quotations will be made upon this list instead of the one the company have until recently been using.

The Billings & Spencer Company.—The Billings & Spencer Company, Hartford, Conn., announce a change in price of the Model '97 Adjustable Bicycle Wrench, manufactured by them, which goes into effect November 1, 1903. Information in regard to the new prices will be furnished upon application.

Cordage.—An excellent demand for Rope is reported by manufacturers, including both Manila and Sisal, especially mixed grades of Sisal. Quotations, on the basis of 7-16 inch diameter and larger, are as follows: Mixed Sisal, $8\frac{1}{4}$ to $8\frac{1}{2}$ cents per pound; Pure Sisal, $9\frac{1}{4}$ to $9\frac{1}{2}$ cents per pound; Manila, $11\frac{1}{2}$ to $11\frac{3}{4}$ cents per pound.

Glass.—A conference of the Wage Committee of the Window Glass Workers of America and the Independent Glass Company and the Federation Window Glass Company was held last week. It has been announced that as a result of the conference there will be no resumption of work in these combined factories until a general resumption is ordered, and that during the next year stoppage and resumption of work will be general in all factories. It is reported that the co-operative companies will also adhere to this general stoppage and resumption plan. The time for resuming operations at the Glass factories is understood to be when the surplus stock of Glass in manufacturers' hands, amounting, it is estimated, to at least 1,000,000 boxes, is disposed of. If these reports are correct, the usually warring factions of the two workers' unions have decided to work in harmony, and the wages of both unions will be uniform. As the scale of wages for the next fire will be a 10 per cent. advance over those paid last year, ruling prices will be unprofitable for the manufacturers to sell at, and an advance in prices is probable. Rumors are to the effect that new prices will be made, to take effect during the present month.

Paints and Colors.—*Leads.*—The fall demand for White Lead in Oil has become more active. Prices are reported somewhat irregular, except for the best brands, of which the larger proportion is sold. Other brands are shaded from $\frac{1}{4}$ to $\frac{1}{2}$ cent per pound, according to make, quantity and purchaser. Quotations for the best brands are as follows: In lots of 500 pounds or over, $6\frac{3}{4}$ cents; in lots of less than 500 pounds, $7\frac{1}{4}$ cents per pound.

Oils.—*Linseed Oil.*—Demand continues light and for small lots. Buyers are awaiting lower prices before placing larger orders. Crushers are not seeking to stimulate trade by making concessions in quotations. Quotations are as follows: City Raw, in lots of five barrels or more, 37 cents; in lots of less than five barrels, 38 cents per gallon. Out of town brands of Raw are quoted, according to quantity, at 35 to 36 cents per gallon.

Spirits Turpentine.—The local market has been affected by the lower tendency of prices at Savannah, and buying has been confined to small lots, owing to the uncertainty of the future of the market. The higher prices which have recently ruled in the South are attributed to speculative movements by operators at Savannah. The market at that point is now easier, and quotations at this point, according to quantity, are as follows: Oil barrels, 55 to $55\frac{1}{2}$ cents; machine made barrels, $55\frac{1}{2}$ to 56 cents per gallon.

REQUEST FOR CATALOGUES, &c.

The trade are given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses:

FROM NEW BRITAIN HARDWARE COMPANY, 120 Main street, New Britain, Conn. This company have recently been organized by L. M. Barnes and H. W. Simonds of Danielson and John R. Davis of Danielsonville for carrying on a retail and wholesale Hardware business. The store will be located in the Preston Block, which was recently purchased by Mr. Barnes. Catalogues and quotations on a general line of Hardware are desired.

EFFORTS TO DEVELOP THE INVENTIVE FACULTY.

THOMAS COLDWELL of the Coldwell Lawn Mower Company, Newburg, N. Y., advocates a new study in the public schools with a view to cultivating inventive genius. He has given the subject much consideration and believes that genius, such as inventors possess, can be cultivated as well as other qualities of the mind. The measures taken by Mr. Coldwell in his factory for the development of the inventive faculty of his workmen is of interest in this connection. On this subject Mr. Coldwell said in a recent interview:

Some men are born with more of the genius for invention than others, but this is equally true in all other things. Some children show a greater natural taste or inclination for arithmetic or grammar, or any other line of education, than do others; and yet we give them all the same general education, regardless of their natural tastes, and often through persistent study and encouragement some of the duller scholars at the start graduate with the highest honors and become our brightest and most successful men.

If this be true in regard to developing genius in these general and popular lines of education, why not in the line of inventive genius? And why should not every boy be given the privilege of developing himself in this line as well as in any other?

To give this a practical test I would suggest that our board of education offer prizes in the manual training department for the best inventions or improvements in connection with their work or tools, either in inventing something entirely new, or any improvement in old things, or any suggestions for improvements in connection with the same.

If the board of education have not the power to offer these prizes, they might allow private individuals to do it. I have tried this plan in our factory, and have been surprised at the development of inventive genius among the men.

During the first six months we had only 11 suggestions for improvements; during the fourth six months we had over 70. And this rapid development was from men who had shown no marked genius in this line previously.

I am so sanguine of the success of this plan in connection with our manual training class that I would be quite willing to contribute \$25 to be distributed in prizes among the boys for the best practical original suggestion or invention they will produce during the coming year.

BARNEY & BERRY'S NEW SKATE CATALOGUE.

BARNEY & BERRY, Springfield, Mass., have issued their illustrated catalogue of Ice Skates for the season of 1903-1904. A feature this year is the new ribbed blade furnished on several different patterns. The line includes the well-known standard styles for gentlemen, ladies and children, several styles for hockey both to screw and clamp, with and without safety edge, tubular (all steel) and wood top racers, ankle support Skates, Skates for the professional and expert with diamond point for fancy skating, with polished or engraved surfaces, down to the inexpensive styles for beginners. The range is comprehensive and complete. A new tool shown for heel button Skates is a folding pocket key, consisting of key shank with two tools appropriately shaped for cleaning shoe heel plates, that fold each side of shank, which when extended afford a leverage for locking double threaded screw clamps.

U. M. C. CATALOGUE.

UNION METALLIC CARTRIDGE COMPANY, Bridgeport, Conn., and 313-317 Broadway, New York, have just issued the most complete and comprehensive illustrated catalogue of their Metallic Cartridges, Empty and Loaded Paper Shells, Primers, Gun Wads, Percussion Caps, Brass Shot Shells, &c., ever put out by them. There are over 30 new Cartridges, rim fire, with both black and smokeless powders; central fire, smokeless powder, for both revolver and rifle, and Military and Sporting Cartridges, to which attention is drawn in one group. For trap shooters there are four new loads in connection with Nitro Club Shells, which have one grease proof and two black edge wads over powder and one cardboard wad over shot.

METHOD OF HANDLING ORDERS FROM TRAVELING SALESMEN.

THE reproduction of the order sheet shown, reduced, in Fig. 1 illustrates the form in use in the sales department of Burhans & Black Company of Syracuse, N. Y., to record orders from traveling salesmen, or mail orders from customers for which salesmen are given credit. The sheet is one with which traveling men are supplied and of which they carry a quantity. The traveler who is accustomed to his work and wishes to save time will write his order on this sheet just as fast as it is given by his customer. Other travelers who feel it necessary to go a little slower to insure against errors

second sheet is simply for a record of total business and profits, but experience has demonstrated the value of other entries to guard against errors, and to obviate delay when wishing to refer to previous records. The record for each traveler is kept on separate sheets.

Number of Order Sheets.

Each traveler is instructed to write at the top of his first sheet, the number of sheets in the order. This is done by a simple notation at the top of his order sheet; at the top of his second sheet of the same order he writes the figure 2, and at the top of the third sheet the figure 3, &c. The number of sheets in the order is also indicated on the sales record in the fourth column. The third column is to indicate the department from which

1 sheet

OK Plumb	DATE SOLD 5/22/03	No. 437	BURHANS & BLACK CO.		Salesman	Swift	DATE BILLED 5/24/03
	TERMS 60	Sold to	John Jones		Town	Suyama ny	
		Laid out by	Dittel		Checked by	Kruger	BILLED BY C.B.

		NET PRICE	LIST PRICE	EXTENSION	COST	EXTENSION
X	1/2 Doz Saythe Smith #50	12.00	6.00		50	
	50%			3.00	12 1/2	2.56
X	1/4 Doz Giant Saythe 32 to 34 in 60			1.50	45	1.13
				4.50		3.69

Fig. 1.—Order Sheet from Salesman or Customer.

will first write the order on a pocket order book and then transfer it to these sheets at their hotel. If a mail order is received which should go to the credit of one of the travelers, it is entered on his sheet by a clerk in the office, as each traveler has sheets which are easily distinguishable from the others. Where there is only a small force this can be done by using different colors. When the company had only four travelers, one had white sheets, another light yellow, a third pink and the remaining one lavender. Of course, there are many other colors which could be used for a larger force.

The Order O. K.'d and Numbered.

After the items are entered on the order sheet it goes to the treasurer's department to be approved as to

the shipping was done. Every salesman's sheets are numbered consecutively, commencing with No. 1, semi-annually. After the order sheet has been numbered in the office, which is simply giving it the next number higher than the preceding order of the same salesman, it is transferred to the order department and given to an order clerk.

Filling the Order.

He gets out the goods, checking each item as he does so. Then when the goods on the order are all assembled in the packing room, another man, designated as "caller," calls back the items in the order from the goods on the floor, and as each item is found to be correct, it is double checked in the manner indicated. The

E. W. SWIFT.				SALES FOR May 1903				No. 202			
Date Received	Order No.	Shipped by	No. of Sheets	CUSTOMER	Date Inv.	Ck M'k	AMOUNT	TERMS	COST	FOLIO	
May	23 437	SR 1		John Jones	5/24		450 60		369	42	

Fig. 2.—Salesman's Credit Sheet.

credit. This O. K. will be noticed in the upper left hand corner. In this instance it is written, but could more quickly be indicated with a rubber stamp. Adjoining this space are two others, the upper one for the date on which the order was taken and the lower for the terms of sale. When the order has been O. K.'d it goes immediately to another desk to be numbered. On the sheet, illustrated in Fig. 1, the number given is 437, and this is entered at the same time upon sheet, Fig. 2. The

man who gets out the goods enters his name in a space at the head of the sheet, as does the man who checks the sheet.

Back Ordering and Pricing.

This work being finished, the foreman of the shipping room makes a memorandum of items back ordered on a blank form provided for the purpose, and this back order memorandum and the sheet are returned to the sales office. There the pricer enters the list prices and dis-

count, or the net prices, and the sheet is then passed to another clerk, who does the figuring and enters the results in the columns headed "Extension." The price clerk is also the cost clerk, and when pricing the order he also enters the cost in the column headed "Cost." Then when both cost prices and selling prices have been extended, the profit in the order is discernible at a glance by simply comparing the totals.

No Shipping of Unbilled Goods.

If a sheet should happen to be mislaid in the shipping room it would be noticed at this time, because the number of sheets is indicated on the first sheet of the order. This is also entered in a column of the sheet for record of sales before the order sheet is sent to the shipping room, therefore the order would not be invoiced to the customer until all the sheets are returned from the shipping room. This is a safeguard against any goods being shipped and not billed.

Making Out the Invoice.

The sheet is now all ready for the bill clerk, and he enters on the sales record in the column next to the one for the customer's name the date on which the order was invoiced; also the total selling price, terms, and in the next to the last column the total cost. The sheet having been billed is then simply laid on top of the previous sheets from the same salesman in a loose leaf file. The sheets are laid in the file consecutively, commencing with No. 1 at the bottom and ending with the last sheet, and also the highest number at the top.

Figuring Net Profits.

The sheets for the sales record of each salesman, or as many as are necessary for a month's business, are footed up at the end of each month, showing each salesman's total sales for the month; also the total cost. The difference between the two totals shows the gross profit for the month. The salesman's percentage of profit is arrived at by comparison of this profit as shown by the record at the end of each month, with the total amount of sales for the same month.

Customers' Accounts.

The bookkeeping is done from the record of sales and not from the order sheet. As the total amount of a sale is entered upon the sales sheet it is posted by the bookkeeper direct to the customer's account on the ledger, the page of the ledger being entered in the last column under the heading "Folio." This does away in the bookkeeping with everything but the ledger, and simplifies the work greatly.

For Future Reference.

At the end of the month the sales sheets are laid in the same loose leaf file on top of the order sheets for the same month. Thus this loose leaf file contains the record complete, as following the sheets for each month are the sales sheets giving the condensed results. At the end of six months all of these sheets are removed from the file and bound in book form, the bottom sheet, or No. 1, being page 1 of the book. Thereafter, should any question arise regarding any of these orders, the complete record of the transaction is easily gotten at. First, it is necessary to know the approximate date of the order in question, and then by turning to the customer's account on the ledger is found the entry corresponding to the date. The bookkeeper in making each entry on the ledger from the sales sheet enters in the margin at the left of the ledger page the number of the order, so that by reference to a customer's account is found first the entry corresponding to the approximate date given, and then in the margin at the left find the number of the order. There is no further research necessary; all that remains is to take down the bound book, or the loose leaf file, and turn to the number indicated by the ledger, where the original order sheet is found containing all the items, prices and extensions, both cost and selling.

E. B. PIKE of the Pike Mfg. Company, Pike Station, N. H., was president of the day and delivered the address at the recent semi-centennial celebration at Concord, N. H.

BUTLER BROTHERS' "RESULTFUL PLANS."

BUTLER BROTHERS of New York and Chicago issue an interesting and suggestive pamphlet containing many descriptions of methods for the extension of business. These are taken principally from various issues of their "Drummer." While not all the suggestions thus given are available for Hardware merchants, many of them are, and the collection will be of interest to the trade. The general character of the pamphlet is indicated in the following extracts relating to methods which have been used:

81. We believe in the use of delivery wagons as advertisers. A sign well displayed on the side of a wagon calling attention to the fact that a special sale is going on is almost as good as a whole page in a newspaper and quite as many people read it.

137. One of the most successful merchants we know of makes a practice each year of spending at least two weeks during the pleasant weather making the rounds of his customers. He drives into the country and endeavors to visit every farmer's home. He thus sees the people in their homes and is better able to tell what they want. He becomes better acquainted with them and consequently gets more of their trade.

HOLBROOK, MERRILL & STETSON'S NEW CATALOGUE.

HOLBROOK, MERRILL & STETSON, San Francisco, Cal., with Sacramento, Los Angeles and New York branches, have just issued illustrated catalogue No. 114 of 1054 pages. It shows in detail merchandise in which they are wholesale dealers, manufacturers and exporters, including Stoves, Ranges, Metals, Iron Pipe, Pumps, Wind Mills, House Furnishing, Tinnery and Plumbers' Supplies. Valuable features of it, aside from the 20 sections or departments into which it is subdivided, is the incorporation of measurements, capacities, weights, number of articles in a package and in an original case. To facilitate export trade there has been inserted approximate weights and shipping measurements when practicable, and also a code word for each article treated in the entire book. It is believed that the latter used in connection with the general telegraphic code in catalogue will markedly curtail the expense of cabling or telegraphing orders. Pages 991-1007 inclusive contain many useful and helpful tables for mechanics in many trades, also recipes and compositions of metals.

The catalogue has evidently been carefully compiled, and is admirably and compactly arranged, showing up in convenient manner the large and varied lines of goods carried.

THE MT. PLEASANT TOOL COMPANY.

THE MT. PLEASANT TOOL COMPANY, Mt. Pleasant, Pa., have been incorporated under the Pennsylvania law, with a capital stock of \$75,000. A plant is to be erected at the above place to manufacture a full line of high grade Shovels, Spades and Scoops. Three styles, open back, plain back and riveted, will be made. The capacity of the plant is to be 100 dozen per day. Natural gas will be used for fuel, and the machinery is all to be electrically driven. Operations on the plant are now under way, and it is expected that their goods will be ready for the market by the first of 1904. The officers of the new company are: J. M. Rowland, president; J. W. Shupe, vice-president; W. A. Kalp, secretary; C. E. Mullin, treasurer; Samuel Greenwood, late of Geo. Griffith Company, is to be master mechanic of the new plant. Sansom & Rowland, 422 Commerce street, Philadelphia, are to be the Eastern selling agents for the company.

A. D. Snyder, New Richmond, Ind., has disposed of his stock of Hardware and furniture to J. H. Fowler and Perry McLain.

The business heretofore carried on by Henry L. Kincaide & Co., under the name of the Hardware Supply Company, Quincy, Mass., has been transferred to Nathan Ames, who assumes the liabilities, and will continue the business.

BRITISH LETTER.

Offices of *The Iron Age*, HASTINGS HOUSE,
NORFOLK ST., LONDON, W. C., Aug. 22, 1903.

The Week's Hardware Trade.

THE past week has shown some slight recovery in various Hardware industries. Improved orders have been received in quite a number of departments. These are, I think, the advance messengers of the autumn trade. Orders to hand are principally for Brass foundry, Heating and Lighting Appliances, Wrought Iron Tubes, Cast Iron Mains, Galvanized Hollow Ware, Lamps, Chandeliers, Locks, Hinges, Stove Grates, Ranges, &c. The bulk of these are from London or from Scotland, but some good indents have come to hand this week from South Africa, India and New Zealand. Although stocks in South Africa are still too much on the heavy side, yet some improvement is recorded in the direction of getting stocks at the ports carried inland.

The experience of many firms engaged in the File trade is that the demand is fairly good, and that there are not many workers, either by hand or machinery, who are altogether idle. So far as prices are concerned, they are extremely low, and many manufacturers are supplying Files at little or no profit. They find that competition is keen beyond anything they remember, both in the home and foreign markets. Principals, it is stated, are coming to the conclusion that they cannot, as formerly, have several months' work on their books, except in the case of big Government contracts, but must be content with a sort of "hand to mouth" business. The development of the motor car business has created a very considerable demand for Files, and in many cases manufacturers of electrical appliances are good customers.

With regard to the Cutlery trade, information obtained from large and small places alike is that business is quiet, though, perhaps, not more so than is usual at this season of the year. It is quite expected that next month, unless something unforeseen occurs, it will begin to move, and go on improving until the end of the year. One market to which attention is being directed is Australia. For the first three or four months of the year very little Cutlery went there, but the market has since broadened, and the exports have been much more satisfactory. Some of the larger houses are doing better with South Africa, and the exports from their representatives are, on the whole, of an encouraging character. There is much less difficulty in getting goods into the interior, and with increased facilities for distribution, trade will, it is expected, develop.

On overseas' account some improvement in European business is reported, particularly with Germany and Holland, who buy English machinery and leather goods in extensive quantities. The recent recovery in Italian industry and credit has stimulated the demand of that country for machinery and iron work. Russia is buying greatly increased quantities of Metal Goods, Cutlery, Hardware and Tin Plates, in anticipation of the new customs tariff, which, it is expected, will increase the duties on these goods, but the Germans are equally alive, and competition with Germany in all these and similar lines is reported to be formidable. Good orders have recently come from Brazil and Mexico, and the Canadian trade, particularly from the eastern sections, is solid and slightly progressive. China has been buying steadily for some weeks past, and orders from other Eastern markets are not to be despised.

Notes for Retailers.

A question not without its difficulties, and which is stirring considerable discussion amongst the associated retail trade of this country, is that of insurance. Some time ago an arrangement was reached whereby the secretary of the Ironmongers' Federated Association, acting through a firm of insurance brokers, was to insure at special rates for all affiliated members. But in some ways this has not proved to be as satisfactory as it was hoped. Delays have arisen in consequence of the necessity of conducting the business through second and third parties. For example, a member would write to the secretary of the association who might be at the other end of the country, and some days would elapse before a reply would

be received. Then the secretary would communicate with the agents, who would in turn have to write to the insurance companies. This seems a very complicated way of doing business, and it is not surprising that one of the important associations has come to the conclusion that members of local associations should pay their premiums direct to the insurance companies concerned. It would appear as if insurance is one of those matters of business detail which can best be transacted between a recognized insurance company and the actual retailer. I think I have observed in discussions on the same subject at American conferences a not dissimilar conclusion has been reached. Mutual insurance companies are difficult to inaugurate over here, owing to the stringent regulations imposed by Parliament. Moreover, I am inclined to think that even if the full total of ironmongery insurance were transacted through a Hardware metal insurance company, it could hardly prove any economic advance upon present methods. If, however, the Hardware and allied trades of Great Britain, America, France and Germany could jointly and mutually insure, then it would be a horse of another color.

Collective Buying.

The question of collective buying and price maintenance is always a live one at meetings of trade associations in this country. As a matter of fact collective buying over here is entirely in its infancy, but the trade is feeling its way surely if slowly. An interested point has been raised as to the actual relation of collective buying to price maintenance. For example, the Welsbach has now accepted the principle of price maintenance, and the wholesale houses selling Welsbach mantles have agreed to conform to the A, B and C selling prices. If individual retailers buy, they come under A, B or C, according to the extent of their purchases. If, however, the members combine locally, in effect they break down price maintenance by collective buying. There does not seem to me to be any objection to this, nor does it appear to contravene the general principle of price maintenance, but of course if the manufacturers fix their prices on the general assumption that retailers buy their own quantities direct, it follows that the catalogue prices must be altered if collective buying is to be the order of the day. One prominent ironmonger will sign a contract on behalf of the association, and possibly on behalf of other associations in the county, and would invoice any goods required at the minimum list price, adding 2½ per cent. to cover the expenses incurred in packing and forwarding. In effect this constitutes the particular retailer who transacts the business on behalf of his fellow traders a wholesale man. Personally I should be surprised if after tasting the pleasures of doing trade on a wholesale scale he would not have his ambition stimulated, and in due course of time blossom forth generally into the wholesale trade.

Preparing for Autumn Trade.

Just now retailers are not doing much, and in consequence are preparing for the autumn trade. American exporters interested in the British retail trade should observe that now is the time for pushing heating Stoves, Coal Economizers and articles of this class. At this time of the year mangles and laundry goods are bought. Another line which in a month from now will be quickening into life is that of hot water service for heating or otherwise. Garden Furniture and Utensils, owing to the bad weather, have been somewhat of a drug on the market, and are just now being sold at reduced prices.

German Cycles.

The export of German Cycles in the year 1900, amounting to 10,400,000 marks, did not equal that of Great Britain (10,800,000 marks), nor that of the United States (12,900,000 marks); yet the difference had been much reduced as against that of 1899, when Germany exported Cycles for 11,700,000 marks, Great Britain for 13,500,000 marks and the United States even for 20,200,000 marks. In 1901 Germany considerably surpassed her two competitors with her export of Cycles (and parts thereof), which amounted to 12,300,000 marks, while Great Britain only exported for 11,800,000 marks and the United States only for 10,900,000 marks. The heavy falling off in the export of American Cycles is most remarkable, for in 1898 it still amounted to 30,000,000

marks, and nearly equaled that of Germany and Great Britain together; it must be mainly attributed to its disappearance from the European market.

Trade-Marks in China.

The commercial treaty of last year between Great Britain and China has been ratified. By Article VII of the treaty the Chinese Government undertake to afford protection to British trade-marks against infringement, imitation or colorable imitation by Chinese subjects, and further undertake to establish a system of registration for foreign trade-marks. This will be a distinct boon for British traders, as hitherto (owing to the omission from former treaties of any reference to trade-marks and for lack of a proper register) great difficulty has been experienced in obtaining the punishment of Chinese traders forging or imitating foreign trade-marks.

The Decimal System in Germany.

In Germany a strong movement is now asserting itself to prescribe, exclusively for the retail trade at least, the decimal system for certain categories of goods which are being imported from abroad in a specific packing. The cue for this agitation is furnished by the law of May 27, 1896, "for the prevention of unfair competition," which, in Section 5, empowers the Federal Council to fix for the sale of certain goods special exclusive units of weights and measures. Such regulations have already been issued in respect of yarns and candles. The Chamber of Commerce at Ruhrort has now come forward asking the Imperial Board of Commerce to enact that oat manufactures may only be sold in such parcels, the net weight of which is 250 gram., 500 gram., or a multiple thereof. Already about 30 Chambers of Commerce have supported this motion, and have at the same time named a series of other goods for which they petitioned similar regulations, among which are cheese, butter, ox tongue, vaseline, maizena, tea, meats, fish, fruit preserves, meat extracts, corned beef, soap, &c. They point out that 1 pound English is equivalent to only 454 gram., as against 500 gram. under the decimal system, so that the public as well as the dealers are damaged, inasmuch as the former expect and the latter actually furnish 500 gram., while the foreign manufacturers, who can offer their shorter weight and cheaper prices, are unfairly benefited. Several Chambers of Commerce have opposed this suggestion, because it would impair the present easy traffic, and because the general public knows that the English pound is lighter. The Committee of the Imperial Board of Commerce has, with an equality of votes, refused to introduce any change. Nevertheless, the possibility still exists that for at least some more categories of goods the petition may be eventually granted, in which case American manufacturers would be compelled to supply the German market with packets complying with the decimal system, if they wished to compete at all.

The American movement in favor of the decimal system carried on in the machine industry has been followed in Germany with much interest. This industry does an extensive export trade in Tool and auxiliary Machinery, and is forced to manufacture it suitable for those foreign markets where the decimal system prevails. The decimal system further recommends itself because parts of such machinery can more easily be locally repaired, replaced or exchanged. Thus it would constitute a great advantage for the wholesale manufacturer and the American export trade generally if manufacture were exclusively carried on on the basis of the decimal system. In the United States itself such "decimal" machines are already salable, and the German commercial world is confident that, with a growing necessity of American export, the movement in favor of the decimal system will spread in the United States.

Prospects in Russia.

In view of the excited condition of the Russian markets, and the heavy purchases now being made so as to obtain deliveries before the new Russian tariff becomes effective, it may be interesting for American exporters to note what are the Hardware and metal goods in which Russian buyers are interested.

ARMS AND AMMUNITION.—The sale of Arms and Ammunition could be extended in Russia by the employment of agents, who

by dint of personal efforts and advertisements would direct notice to their goods and so secure purchasers. At present the market is almost exclusively supplied with cheap and inferior Belgian and German productions. If prices for serviceable, substantial smallarms were at the same time lowered, larger sales than at present could be secured. The superiority of British make is fully appreciated by sportsmen throughout the country.

BRASS AND MANUFACTURES OF BRASS.—Foreign brass and manufactures of the same present but a limited field in Russia; the native producer satisfying the actual demand for them, one large brass rolling works supplying all the demand for the raw material.

VARNISHES.—The native supply of Varnishes being good and well satisfying existing demands, no scope for importation exists.

CUTLERY AND HARDWARE.—The branch of Cutlery and Hardware is gradually passing into German hands in Russia; the appellation "British" signifying in this country the best quality, is becoming only a term for trading purposes.

MOTOR CARS.—Motor Cars, though not used to such an extent as in other European capitals, are increasing in demand at St. Petersburg. German, French and Belgian makers supply nearly all the local requirements, and there seems to be no reason why American manufacturers of Motor Cars should not join in the competition for supplying them, thus sharing the large profits of the trade. The bad condition of the high roads in Russia confines the use of Motors almost entirely to the capitals and larger towns and their immediate suburbs.

CLOCKS AND WATCHES.—During the last ten years there has been a considerable expansion in the trade of Clocks and Watches in Russia. American Watches are good and cheap, and compete successfully with those of Swiss make. The works are generally imported separately from the cases for diminishing the rates of duty on them. The center of the trade is at Warsaw. A special agent or commercial traveler might push these sales considerably in Russia.

ELECTRIC LAMPS.—The German competition that prevails in Russia in Electric Lamps, by diminishing price and reducing quality, has almost ruined the trade. The lamp mostly in use is the Edison, with a screw, and the voltage 110. Native production is exceedingly small.

ELECTRIC MACHINERY.—Electric machinery, both for technical and medical purposes, offers a promising field in Russia. This was well appreciated by large German and Austro-Hungarian electric works, which have established branches in the country. The names of British makers remain almost unknown to Russian purchasers.

SANITARY WARE.—British Sanitary Ware is held in high esteem in Russia. Manufacturers and shippers should, if possible, lower their prices and appoint more agents and not sole buyers; this is all the more urgent considering that native works are trying to produce Sanitary Ware.

GLASSWARE.—The native production of Glassware being of inferior quality, there is a demand for foreign glass of a better kind, and also for that employed for technical purposes (scientific, chemical, &c.). There is none of British make in the market, although some may be imported through Germany. Bohemian Glass commands in Russia a ready and extensive sale.

HAND TOOLS, INDUSTRIAL AND OTHER.—There is undoubtedly a market for industrial and other Tools in Russia, and American makers should not neglect it. Agents and travelers are absolutely necessary for pushing these articles, the price of which it is necessary to reduce as much as possible in order to render competition with similar German goods successful.

LEATHER AND LEATHER GOODS.—There is a considerable demand for Sole Leather in Russia, and some is obtained from the United States, while the native article is prepared at the tanneries of St. Petersburg, Riga, Warsaw and Finland; leather for Furniture is also imported: it is called "British" in the trade, but comes generally from Germany, France and Austria-Hungary. There is certainly a market for American leather, shoe and other, and the Russian market for it should not be neglected. There is a considerable demand for fancy leather goods, Harness and Saddlery, and Leather Trunks and Bags. All these articles are chiefly supplied by Germany. American manufactures of this description would meet with a good sale, and should be able to compete with similar productions of foreign countries.

MACHINERY.—Owing to the general unsatisfactory state of trade and depression of industry in Russia there was a diminished demand for machinery, the metallurgical industry, cotton and wool mills being principally affected. It may perhaps not be superfluous to direct the attention of American manufacturers and shippers to the existence of a considerable demand in Russia for many kinds of printing, seed crushing and saw mill machinery; also for Pumps and appurtenances for the petroleum industry, for machinery for sugar and soap works, and for paper making machines and appliances.

METALS.—The importation of Copper into Russia seems to be altogether monopolized by Germans, owing, it is said, chiefly to the facility with which they discount Russian bills and drafts at sight. Considering the large consumption of Copper in Germany, far exceeding that of Great Britain, it is very interesting to mark the growing extent of Germany's exportation of this metal. The conclusion to be drawn therefrom is that a central market of such an important article as Copper is being established in Germany.

LEAD AND ANTIMONY.—Although Russia imports a large quantity of Lead, the consumption being various and increasing, British exports of this article to Russia are declining, the trade being also ruled by Germany. Antimony, besides its

other uses. is extensively employed for printing purposes, and is imported in growing quantities. The importation is mostly Austro-Hungarian.

THE NORWALK LOCK COMPANY.

THE NORWALK LOCK COMPANY, South Norwalk, Conn., have been reorganized with ample capital to enable them to manufacture goods on a scale which will permit them to fill promptly all orders. Frank S. Cowles, who has been with the company for 20 years, seven years in New England and 13 years in New York as the New York manager, has been made president and treasurer, and George R. Barnum, who has occupied the position of bookkeeper at the factory for 16 years, has been elected secretary of the company. The company intend to market their entire product through the Hardware trade. With largely increased facilities, they are hoping not only to increase the production of the factory but to maintain the reputation of the company for high grade goods. They will have the best wishes of many friends in the trade for their success under the new auspices.

PRICE-LISTS, CIRCULARS, &c.

F. E. MYERS & Bro., Ashland, Ohio: Catalogue and price-list No. 38, devoted to a varied line of Pumps, Hay Tools, Store Ladders, Door Hangers, Bicycle Stands, Gate Hangers, &c. Among recent additions to the concern's line are Painting and Coating Machines, Sling Hay Pulleys and Gate Hangers.

THE ROGERS SCREW COMPANY, Providence, R. I., issue the list of Wood Screws adopted July 22, 1903, with net prices figured at 65, 70, 75, 80 and 85 per cent. discounts for use of retail merchants.

THE ROSS SUPPLY COMPANY, Greenville, Ohio: Illustrated catalogue No. 17, devoted to Wind Mills, Pumps, Wrought Iron Pipe, Tanks, Pump Supplies, Road Graders, Soil Pipe and Fittings, Malleable and Cast Iron Fittings, Pipe Tools, &c.

THE BILLINGS & SPENCER COMPANY, Hartford, Conn.: Small illustrated catalogue devoted to Sportsman's Knife, Magazine Screw Driver and Knife, Cigar Cutter and Whistle, Adjustable Pocket Wrenches, Combination Pliers, Improved Key Ring, Drop Forgings and Machinists' Tools.

W. & B. DOUGLAS, Middletown, Conn.; New York office, 83 John street: Illustrated catalogue of Power and Electric Pumps, Boiler Pumps, Force Pump Standards, Air Pumps, Countershafts, Grindstone Frames, &c.

ANSONIA BRASS & COPPER COMPANY, 99 John street, New York, in connection with the international yacht races issue an illustrated pamphlet containing a short description of cup defenders, the hulls of which are constructed of Tobin bronze.

THE WALLACE BARNES COMPANY, Bristol, Conn.: Catalogue No. 3 relating to Motor, Clock, Compression, Extension and special Springs. Included is a sheet showing the sizes of high grade cold rolled untempered Spring Steel, which the company generally have in stock, the several grades varying in width from $3\frac{1}{8}$ to $6\frac{1}{2}$ inches.

R. D. NUTTALL COMPANY, Pittsburgh, Pa.: Nuttall Products is an illustrated pamphlet devoted to the production of gears from the smallest to 30 feet in diameter, to union standard trolleys and to union standard sheet cutter.

P. & F. CORBIN, New Britain, Conn., and 11-15 Murray street, New York, are distributing among customers and others interested a fine view of New York's sky line, approaching from the Jersey shore, and including the great sky scrapers, from the New York Life Insurance Building, at Leonard street and Broadway, to the Battery. It is printed on heavy paper, suitable for framing, and is 43 x 14 inches in dimensions. The purpose of it is to call attention to the many important buildings in the business heart of New York in which their Builders' Hardware has been used in the way of trim. This is accomplished by means of symbols which indicate buildings wholly trimmed with Corbin Hardware, new portions of older buildings similarly trimmed, and important portions of buildings using it.

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SARGENT & CO.'S SHOWROOM.

SARGENT & CO.'S new Chicago offices are located in the Dickey Building, 40 Dearborn, corner of Lake street, and comprise a suite of three rooms—reception,



Reception Room.

salesmen's and sample rooms, represented in the accompanying views. All are well lighted with both natural and artificial light, and are very tastefully decorated in shades of green and buff, while the wood work and fur-



Salesmen's Room.

niture are all in mahogany. The reception room is at the end of the elevator corridor and in plain view of every one alighting from the elevators. This room has free hand decorations, consisting of sprays of wild flow-



Sample Room.

ers and chrysanthemums, carried around the frieze. All rooms are carpeted alike in green body brussels. The sample room, of which two views are given, is fitted up

with a large case containing 60 drawers below and six compartments above, each of the drawers holding three boards of Art Hardware. The six compartments above are in white enamel inside with plate glass doors to slide up, and have removable paneled backs, upon which will be mounted samples of the large line of Coat and Hat Hooks, Ceiling Hooks, &c.; Bolts, Cupboard Catches, Drawer Handles and Pulls, Knobs, Escutcheons, Push Plates, Door Pulls, &c., which are manufactured by Sargent & Co. In one corner of the sample room is a large case, containing 32 drawers for Store Door Handles, Art Push Plates and Door Pulls, Locks, Pulleys, &c. Balancing the above case on the other side of the room is a case for mounted samples, having compartments for Store Door Handles, Cylinder, Front Door Sets, Bit Key, Front Door and Inside Sets and small miscellaneous mounted samples. Across the front and one end of the sample room is a window seat, 24 inches wide. In the center of



Sample Room.

the sample room is a large mahogany table, 4 x 8 feet, with the ends solid in panel form, to be utilized in the display of mounted samples of Art Hardware on special occasions.

SUMMER OUTING OF CONNECTICUT ASSOCIATION.

THE first annual summer meeting of the Connecticut State Association of Retail Hardware Dealers was held at Momauguin on Wednesday, August 26. This is a shore resort about 5 miles east of New Haven, and a more ideal place for such a meeting could not have been chosen. It has a beautiful shore front and an unobstructed outlook over Long Island Sound. The day was pleasant and the large piazzas of the house were very attractive to the members gathered there.

The business meeting was presided over by A. H. Abbe, president of the association. Various matters of interest were discussed and much enthusiasm shown in regard to the working of the organization. A shore dinner was served at 1.30, and Manager O'Toole set forth a goodly array of shore dainties, of which the association showed a hearty appreciation. President Abbe presided as toastmaster, and his remarks were well chosen and his stories well pointed. Various members and guests were called upon for speeches, which were thoroughly enjoyed by those present.

The following members were present:

- A. H. Abbe, A. H. & E. W. Abbe, New Britain, Conn.
- Chas. L. Way, Way Hardware Company, Hartford, Conn.
- J. C. Bidwell, J. C. Bidwell & Co., Hartford, Conn.
- Ell C. Birdsey, Birdsey & Raven, Meriden.
- R. I. Barber, Rockville.
- Henry Lockwood, Lockwood & Palmer, Stamford, Conn.
- Frank W. Palmer, Lockwood & Palmer, Stamford, Conn.
- Henry S. Hitchcock, F. F. Hitchcock, Woodbury.
- W. B. Dickerman, Dickerman Hardware & Supply Company, Wallingford.
- S. L. Way, Way Hardware Company, Hartford.
- W. A. Church, the F. Hallock Company, Derby.
- I. C. Treat, Clapp & Treat, Hartford.
- E. M. Walsh, R. B. Bradley Company, New Haven.
- D. B. Wilson, the D. B. Wilson Company, Waterbury.
- John M. Page, John M. Page & Co., Naugatuck.
- Geo. D. Buck, John M. Page & Co., Naugatuck.
- Arthur H. Bishel, Smith & Bishel, Middletown.
- Frank T. Terry, T. P. Terry & Son, Ansonia.

Geo. I. Clapp, Clapp & Treat, Hartford.
 Lewis B. Crosby, the G. M. Williams Company, New London.
 Fred. D. Jordan, Jordan Bros., Willimantic.
 Jas. D. Phelps, F. S. Bidwell & Co., Windsor Locks.
 S. L. Ewald, Lyon & Ewald, New London.
 F. William Hallock, F. Hallock Company, Derby.
 W. F. Hueston, D. N. Clark, Shelton.
 Geo. M. Baldwin, T. Mawley & Co., Bridgeport.
 R. C. Lightbourn, the Lightbourn & Pond Company, New Haven.
 Geo. H. Pond, the Lightbourn & Pond Company, New Haven.
 Geo. H. Baker, the Geo. H. Baker & Co., New Haven.
 Robert Gardner, the F. Hallock Company, Derby.
 D. N. Clark, Shelton.
 R. T. Warner, the W. A. Warner Bros. Company, New Haven.
 W. H. Burchell, the N. T. Bushnell Company, New Haven.
 D. K. Allen, Greenwich.
 F. W. Jaynes, Jaynes Hardware Company, Greenwich.
 R. F. Davis, Jaynes Hardware Company, Greenwich.
 R. E. Page, Hartford.
 Halsey W. Kelley, the John E. Bassett & Co., New Haven.
 George J. Bassett, the John E. Bassett & Co., New Haven.

The following gentlemen were present as guests of the association:

J. D. Sargent, Sargent & Co., New Haven.
 R. M. Parsons, Stanley Rule & Level Works, New Britain.
 W. E. Stevens, Stanley Works, New Britain.
 H. G. Bowman, Russell & Erwin Mfg. Company, New Britain.
 W. L. Humason, Humason & Beckley Mfg. Company, New Britain.
 E. G. Huntington, P. & F. Corbin, New Britain.
 Geo. W. Corbin, Corbin Cabinet Lock Company, New Britain.
 A. F. Corbin, Corbin Cabinet Lock Company, New Britain.
 W. H. Booth, Corbin Cabinet Lock Company, New Britain.
 D. E. Dean, P. & F. Corbin, New Britain.
 John W. Townsend, Bronson & Townsend, New Haven.
 F. A. Kantz, New York.
 Thad. B. Beecher, Bridgeport.

The whole affair was voted a grand success, and reflected great credit upon the committee having it in charge. It also illustrated the advantage there is in a summer meeting, giving opportunity for social acquaintance and the discussion of trade questions.

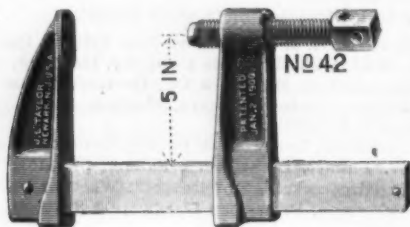
MISCELLANEOUS NOTE.

Page-Storms Drop Forge Company.

The Page-Storms Drop Forge Company, successors to the Springfield Drop Forging Company of Springfield and Chicopee Falls, Mass., are adding new lines of wrenches to their product. The new lines will be construction wrenches, angle wrenches, a wrench to be known as the Wolf Jaw, which is similar to the alligator wrench, and a new S-wrench with concave handle for nuts, set screws and cap screws. The company will also enlarge lines manufactured by the Springfield Drop Forging Company, including single and double end engineers' wrenches, single and double end set screw wrenches, too post wrenches, chuck wrenches, S-wrenches and milling machine wrenches. New drop hammers are being installed and preparations made generally for pushing the business.

Taylor Self Adjusting Self Locking Clamp.

James L. Taylor, 30 Lawrence street, Newark, N. J., manufacturer of a large line of Taylor quick adjusting self locking clamps, John H. Graham & Co., 113 Chambers street, New York, selling agents, have supplemented the line by the addition of the Taylor self adjusting, self



Taylor Self Adjusting Self Locking Clamp.

locking steel bar clamps No. 42, here illustrated. This clamp is intended to be used where a deep engagement is required, being recommended by the manufacturers as especially serviceable in ship building and other struc-

tural work, and for clamping down the "old man" in ratchet drilling. It has a high grade steel bar 2 x 5/8 inches with 1 1/8 inch diameter steel screw. It can be furnished with or without cap on end of screw. The clamp is tested to safe clamping strain of 5500 pounds. There are eight lengths of opening, 6 to 36 inches inclusive, increasing by 2 inches up to 12 inch size inclusive, the remainder increasing by 6 inches. A new catalogue of the entire group, with revised price-list, has just been issued.

Bon-Vee-Von Lunch Box.

The Union Luncheon Box Company, 17-21 Park row, New York, have just put out the Bon-Vee-Von (bon-vi-vant) luncheon box, as shown in the accompanying engravings. It is designed not only for work people, but tourists and travelers, whose movements cannot always



Fig. 1.—Bon-Vee-Von Lunch Box, Closed.

be in touch with dining centers, its attractive appearance making it unobjectional to even fastidious people, appearing when closed much like a camera or physicians' case. As seen in Fig. 1, it is 8 inches wide, 7 inches high and 5 inches from front to back, the outer casing being covered to resemble pebbled morocco with leather handle and metal plate for engraved name or initials. The box proper, which is entirely separate from the outer case, is made of tinned plate, and as far as possible, parts are



Fig. 2.—Interior Metal Box, Front Dropped.

formed in dies from one piece of metal without seam or solder. The three food trays are each of one piece, in which to carry sandwiches, meat, cake or any kind of solid food. An individual with even moderate culinary ability can use the trays in connection with the brass alcohol stove to prepare a number of simple dishes with little trouble. For instance, a rasher of bacon can be placed in a tray and the stove lighted, and when the thin slices are sufficiently cooked, one or more eggs can be broken in. Other practicable combinations will readily

suggest themselves, aside from warming a flask of coffee, tea, chocolate, soup, &c., or various solids more palatable warm than cold. The rectangular flask, more clearly seen in Fig. 3, will hold three or four cups of any liquid preparation, the flask being suspended from the top of its compartment over the stove by a double hook of strong wire. The flask and contents can also be placed on stove, radiator, boiler or other vehicle of heat if desired. The trays rest on metal supports and do not occupy the full height of the interior, there being a space below and above the middle tray. The heat is confined to the flask cham-



Fig. 3.—Showing Trays and Flask.

ber or allowed to circulate around any one or all of the trays at the option of the individual by means of metal slides, which act as dampers when the box is closed. There are also above the middle and bottom trays metal edged asbestos shelves or mats which slide on metal supports, serving as covers to the trays and playing an important part in warming or preparing food. The alcohol lamp with removable brass top is filled with shredded asbestos, so that a portion of alcohol can be put in and retained until needed, a tablespoonful being sufficient for all ordinary purposes. The company issue for dealers an attractive 20-page booklet for gratuitous distribution among customers that describes the box thoroughly.

Faucet Water Filter and Purifier.

The faucet filter shown herewith is made of brass, nickel plated, and is attached to the faucet at sink, bathtub, &c., by the coupling at the top. It is referred to as



Faucet Water Filter and Purifier.

being easy to take apart, to put together and to adjust and as capable of being cleaned in a minute. Material for refilling, it is stated, can be obtained at any plumber's or hardware store, or enough to last a year will be furnished by the manufacturer for 10 cents. The filter is put on the market by J. P. Rummel, Sioux Falls, S. Dak.

Bardsley's Oil Door Check and Spring.

Joseph Bardsley, 147-151 Baxter street, New York, has just put on the market Bardsley's oil door check and spring, 1903 pattern, as here shown. This check has novel features, which are the outgrowth of use and experience, the object in this instance being to simplify the check and eliminate developed weaknesses. This check can be applied to either right or left hand doors, or either side of the same door, without any change whatever, it being possible to take a check as it comes from the original package and screw it to the door. Applying it to right or left hand doors, or either side of any door,

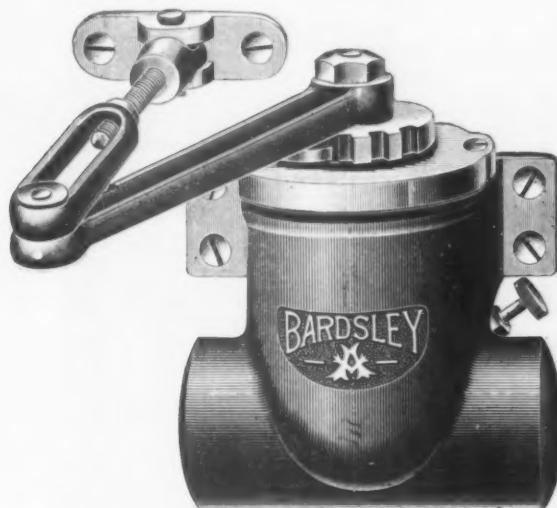


Fig. 1.—Bardsley's 1903 Pattern Oil Door Check and Spring.

involves only the proper position in which to screw the lever clamps. A coiled crucible wire spring is now used of ample length and diameter, oil tempered after it is formed, and so arranged that it cannot be overwound in the cylinder. We are advised that as now made the checking liquid is a specially prepared oil, which is non-volatile and practically nonfreeable. Also the checking cylinder and the spring chamber connect with each other so that the checking liquid not only fills the checking cylinder, but also half fills the spring chamber, thus furnishing an excess of liquid sufficient to last several years, which likewise serves as a lubricant and prevents wear of the working parts. The spring is easily wound by

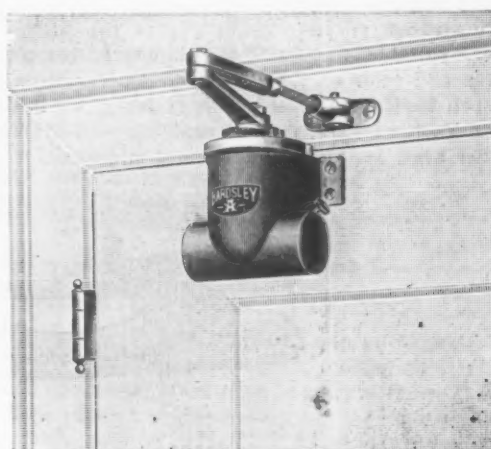


Fig. 2.—Showing Bardsley's Door Check Applied to Door.

means of the lever arm to obtain the proper tension and without the use of any special tool. The checking screw is placed where it is not likely to be tampered with or injured. Another feature is that the checking power can be so adjusted as to cease when the door is near a closed position. The check is made in sizes A, B, C, D and E, for light inside doors not over 2 feet 9 inches wide up to extra large and heavy doors requiring the most powerful springs.

The Warren Shelving Cabinets.

The accompanying cuts represent new designs in shelving, made by the J. D. Warren Mfg. Company, Chicago, Ill. The upper cabinet and base are constructed as one and are designed especially for use by firms wishing inexpensive, neat shelving, this being constructed in such form that, while suited to hardware stores carry-

scriptions, its proportions being well suited to everything accumulating in an office. When sold for such purposes the open space is provided, if desired, with sliding doors, either glass or paneled oak, as may be preferred.

Fig. 2 shows a cabinet of similar style, with sliding doors in the upper portion and adjustable shelves in lieu of drawers, suited to display of tinware, tea and coffee pots, &c.; also for guns, hammers, hatchets, draw knives,

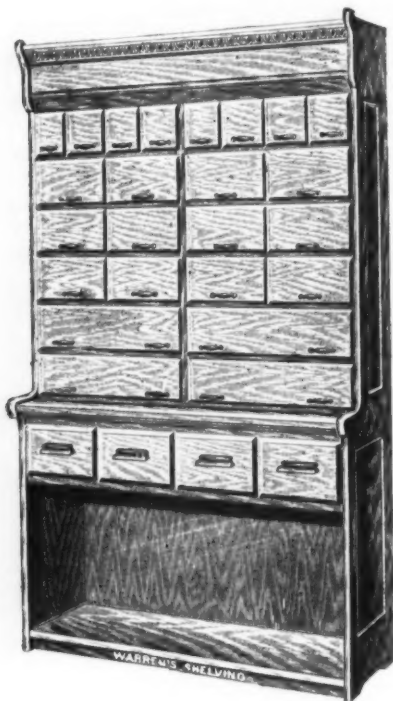


Fig. 1.—Warren's Combination Cabinet.



Fig. 2.—Warren's Combination Sliding Glass Door Cabinet and Base.

ing all styles of stock, it is well adapted to stores having small stocks, and to buildings that are narrow in space between walls. The company remark that in the cabinets they have provided a style of shelving that retains all the neatness of finish and good quality of work that exist in their other patterns, but at a price to be popular with all. The upper portion of the cabinet, shown in Fig. 1, is equipped with drawers, assorted in widths from 6 to 24 inches, and 6 inches in high, those in the lower portion being 8 inches in high and 12 inches in width, as illustrated, or assorted in any of the widths given above, suitable for hammers, hatchets, braces, draw knives and tools of similar class, underneath which is an open base, with raised bottom, for goods in original boxes, such as axes, barn door hangers, scythe stones, powder kegs, &c. If a middle shelf is desired, it will be

planes, &c., when equipped with suitable brackets for same.

Lock Lever Ribbed Ice Skate.

Barney & Berry, Springfield, Mass., have put on the market the Lock Lever ice skate with ribbed blade, here shown, which has heretofore been made only in the plain blade style. The skate is adjustable sidewise on any style or shape of shoe, the two threaded screw B shortening the separable clamp, allowing clamp D to open wider than at C, thus bringing the skate nearer the inner side of shoe. When the skate is adjusted to any particular shoe and set for use, the rotary movement of the main adjusting screw is locked by a small set screw in the stud at A, which prevents any loosening of skate in use



Lock Lever Ribbed Blade Ice Skate.

furnished. The cabinet corresponds in height to the company's other bases and cabinets, 7 feet 1½ inches, and are 4 feet in width, the sides being flush, so that they abut solidly together, forming any length of shelving desired.

The cabinet is also adapted for implement houses, machine shops, foundries, warehouses and factories, as well as individual use, where neat, practical compartments are required to keep miscellaneous possessions in. It has also been found useful for the office, for containing pamphlets, catalogues, and stationery of various de-

and keeps it ready to attach to the same shoe without readjustment. The skate is made in sizes 9 to 12 inches inclusive, increasing by ½ inches, in Grade 3 only, polished and nicked. This style can be furnished in a narrower plate for ladies if so ordered. The entire line can be furnished by Walter B. Stevens & Son, 114 Chambers street, New York, and 412 Commerce street, Philadelphia, Pa., and H. A. Whittemore & Co., 89 Pearl street, Boston, who carry large stocks of B. & B. skates, as the manufacturers' representatives in the cities named and adjacent territory.